

POPULAR

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Computing

4-10 October 1984

WEEKLY

It's the best selling weekly

Vol 3 No 40

US games invasion continues

MORE American software is on its way to Britain for Christmas, this time from a new company, Ariolasoft.

Set up as a sister company to Arista Records and Ariola, it will be headed by Ashley Gray and Frank Brunger, formerly of CBS.



Ashley Gray

So far Ariolasoft has reached agreement with two of the biggest and fastest-growing software companies — Electronic Arts and Broderbund — to market their titles in the UK and Europe.

"At first we will be working

Oric sues Prism

TROUBLED micro manufacturer Oric Products International has served a writ against its distributor, Prism, for £4m damages.

Oric claims Prism has broken the contract between the two companies: "Prism was to become Oric's primary distributor, but Prism failed to meet the obligations of that agreement. The £4m refers to loss of sales suffered by Oric," said an Oric spokesman.

Prism will be responding to the writ. "We utterly refute everything that Oric are saying

and our solicitor has already filed a response," said Bob Denton, Prism's group managing director.



Bob Denton of Prism

"One problem with Oric has been the price cutting of the Atmos in stores. It was selling at £99 in Green's at a time when Oric's price to us was £115."

This is the second writ that Oric has served in the last two months. In August, they filed a countersuit against KMP, its advertising agency, after KMP sued for £200,000 for non-payment of debts. Oric's countersuit was thrown out of court.

Four million pounds is reported also to be the estimated amount of Oric's total debts at present to creditors.

Terry Shurwood, Oric's sales manager, last week denied reports that Oric had been refinanced.

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on repackaging the titles and putting them on cassette, so they will first be available for the Commodore 64," explained Ashley Gray. "Where feasible, we will later be converting to the Spectrum, and eventually looking at the MSX machines. However, no firm conversion

schedules have yet been fixed."

Nor has the order in which the games will appear, but Ashley said, "We will not be bringing them all out at once, as there are 60 titles in total, but our target launch date is set for early November, in order to have the first titles available in volume for Christmas."

"Prices for the range aren't fixed yet, but they will be at the upper end of the price spectrum, in line with the sort of prices US Gold, for instance, are doing."

In the long term, Ariolasoft plans to gain licences from other US companies, and, in turn, market its own British titles in the States.

● Ariolasoft will not, however, be the only company marketing Broderbund games in this country. Software Projects is

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New micro for Sinclair?

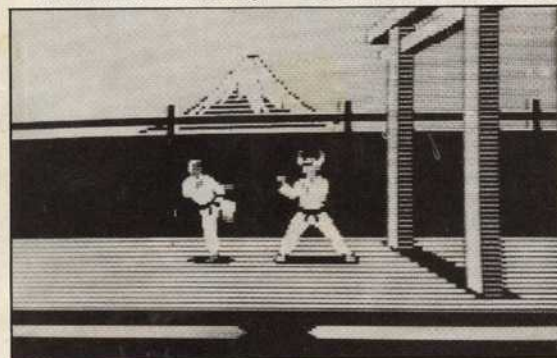
IT now seems possible that Sinclair will launch a new low-cost home computer next year.

Despite strong rumours that Sinclair is planning an expanded Spectrum machine with built-in microdrives and a proper keyboard, the new games computer is more likely to be 68008-based cut-down version of the QL without microdrives but with 128K Ram, sprites and a cassette port.

Sinclair has publically committed itself to the 68000 chip series as "the chip architecture we have chosen for the next decade".

Nigel Searle, the company's managing director, last week denied any plans to launch an

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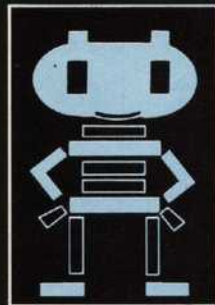
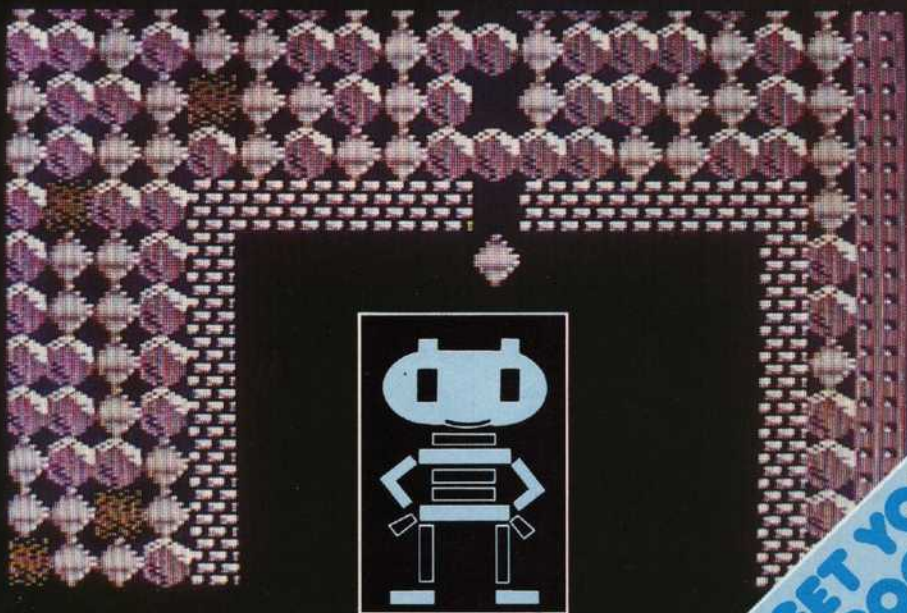
Broderbund's Karateka

INSIDE

COMPUNET CANNIBAL ISLAND C16 REVIEW

BIGGER, BOULDER, ^{More} BEAUTIFUL AMERICAN NO 1.

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86 LEVELS

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Really Something Else

The micro industry is no longer the licence to print money that it was once thought to be.

The devastating US price war in home computers has proved conclusively — if any were needed — that the business is now ruthlessly commercial and that profit margins have been slashed to the point where nobody can make enough money to stay in business.

In this country profits on microcomputer hardware are now — with the curious exception of Acorn's BBC machine — pared to the bone. The same thing is happening in the software prices.

Oric has more or less given up on the British market. Computers has gone. And it is left — in the low price range — for Commodore and Sinclair to slug it out.

Can the companies afford to carry-on chopping away at each other like this?

The answer is probably no. As just one indication of how much the price-war in the UK is beginning to hurt Sinclair last week announced disappointing profits for the year ending in March.

The most serious implication of the price-war is the uncertainty it generates in people's minds about the long term future of many of the micro companies.

Those who are most uncertain and nervy now are precisely those who were the keenest supporters 12 months ago — the banks and the venture capital companies.

Where before the word 'micro' acted as a magic key to release a deluge of support it now has the reverse effect.

If you are thinking of setting up a new little venture I wouldn't mention to your bank manager that it has any connection with micros or new technology, if I were you.

POPULAR Computing WEEKLY

Vol 3 No 40

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A challenging word game for the Amstrad... auto-run your programs on the QL... and a statistics program on the BBC.



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ABC

56,052 copies sold every week
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Computer Trade Association Magazine of the Year

IS YOUR COMPUTER WATCHING YOU?



October's Your Computer finds out who's really in control, you or your micro.

It discusses the controversial film "1984," and discovers what politicians think about computers. There's even a program that could get your micro into Mensa.

Plus reviews of the Commodore 16 (which you can win), and of the Commodore Plus 4 and the latest software for the CBM 64 and Spectrum.

All in October's Your Computer.

Out now.

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Alien—game of the film

ARGUS Press Software has acquired the rights from Twentieth Century Fox to produce a computer game based on the film *Alien*.

"*Alien* will form part of our *Mind Games* series," explained Peter Holme, Argus's market-

The team of programmers for *Alien* includes people who used to work for failed Liverpool company Imagine Software, although Peter was unwilling to name names.

The *Alien* computer game will be released in November



ing manager. "The player controls the commander of the space ship, but must manipulate and interact fully with the other characters in the game, who all have their own individual personalities."

"You must save the ship and crew from the alien; the rating at the end of the game depends on whether you succeed, or let the beast get to Earth and destroy the human race."

"Because of the changing personalities of the characters in the game, the play will be quite different each time. For instance, if someone picks up a weapon, their confidence factor automatically increases."

Sinclair

Continued from page 1

upgraded Spectrum machine to sell for around £150: "Such a machine would bring us into head-on competition with the Commodore 64."

"Also it would encourage software authors to write for an expanded Spectrum and Z80 chip at a time when we want to focus attention on writing for the QL and 68008."

US games

Continued from page 1

set to release Broderbund's *Loderunner* on Commodore 64 next week, at £9.95.

"*Loderunner* has 150 screens, and also incorporates a games designer, in that the player can alter the parameters of the game. Graphically it's not

to coincide with the relaunch of the film. It will be published simultaneously for the Spectrum and Commodore 64 and will cost £8.99.

● Argus has also recently completed the takeover of another Liverpool software house, Starcade. Its latest release, *Savage Pond*, for the BBC and Atari, is to be converted for the Spectrum, and relaunched by Argus.

"Starcade is a father and son team, who wanted to concentrate on programming, rather than spend time on administration, so the sale to Argus was advantageous for them," said Peter.

Tune in to Channel 8

CHANNEL 8 Software has launched a MIDI music keyboard interface — Midisoft 1 — to run with the BBC, Commodore 64 and the Sinclair QL.

Also included in the package is software enabling the user to create polyphonic sequences in segments and chains, edit scores from staves displayed on screen, and

going to bowl anyone over, but it has an enormously addictive quality," said Software Projects sales manager Colin Stokes.

"As far as I am aware, our contract with Broderbund is non-exclusive, and we are currently negotiating with them to market the top US title *Raid on Bungling Bay* in Britain as our next release."

Ex-Imagine directors in court

AT a committal hearing at Liverpool High Court, ex-Imagine Software directors Dave Lawson and Mark Butler were ruled to be in contempt of court, after failing to attend a previous hearing.

Lawson and Butler had been instructed under a court order to release former Imagine shareholder Steve Blower from the personal guarantee on Imagine's £100,000 bank overdraft.

The High Court judge said, however, that it would not benefit Steve Blower if Lawson and Butler were sent to prison or fined for contempt. The order to remove Blower's name still stands.

"This dispute about the overdraft has been going on since February 10th this year, when I reached an out of court settlement with Dave Lawson and Mark Butler to pay me damages and take all possible steps to release me from the guarantee," said Steve Blower. "They did not do so."

The overdraft, at Lloyds Bank in Water Street, Liverpool, is jointly guaranteed by

Dungeons & Dragons from PSS

Swords and Sorcery is the next major release from Coventry based software house PSS.

The program is a Spectrum adventure combining text, 3D and maze graphics and many Dungeons and Dragons role-

playing games type features.

"With Midisoft 1, you can use the computer's memory to store tunes in real time and manipulate them. You can correct the timing on your playing, or alter the tempo if you wish," said Channel 8's chairman Norman Perriam. "Connecting to the micro means that you can control up to 16 synthesizers at any one time."

Midisoft 1 should be available in November, priced at £189.95.

Details from Channel 8, 51 Fishergate, Preston, Lancs.

● The QL monitor produced for Sinclair by MBS Data Efficiency will sell for £299, not £199 as reported in last week's issue.

Oric

Continued from page 1

"Oric will continue as it is, without any cash injection," the Oric spokesman confirmed.

Two Oric directors, Barry Muncaster (managing) and Paul Johnson (technical) have, however, refinanced Tansoft, the software company which has written extensively for both Oric machines. The two, between them, have acquired Tansoft for an undisclosed sum.

all three men, each of whom are personally responsible for the full amount if one or both of the others cannot meet their share of the debt.

After Imagine went into liquidation in July, Steve Blower obtained the court order instructing Lawson and Butler to remove his name within three days.

"They failed to do that, and then did not attend the court hearing when the three days were up," Steve Blower said. "The judge said that the court order was still in force and that Lawson and Butler must pay all the legal costs. With interest, the overdraft is now around £112,000. I am now talking to my solicitor to see what we can do next."

The playing screen is divided into three sections, a bottom text screen, a 3D view of a maze and a top view of part of the same maze. As in role-playing games your 'character' develops in skills and experience over a number of games.



There are a variety of objectives within the game including treasures to be found and quests to be undertaken. All the characters are animated in high resolution 3D. The game is due for release in October.



How to teach your Micro a thing or two

Thousands of home computer owners have yet to discover their microcomputer's potential to help with many of the problems and decisions that come up every day in the home or office.

Perhaps you have always promised yourself that you would teach yourself programming, but have been put off by manuals which seem to assume a lifetime spent studying computer science and mathematics. Maybe you have looked at other computer books, but have yet to find one which is free of unnecessary jargon or where the program examples bear some relevance to real life and not space invaders.

Relax, your search is over.

The 'Learn BASIC' tutorials from Logic 3 are the latest development of a teaching method pioneered by Professor Andrew Colin and perfected

by testing on 3 generations of students at Strathclyde University. The 'Strathclyde Method' has been translated into 8 languages and used by over 300,000 microcomputer users.

'Learn BASIC' is a jargon free, step by step, course in computer programming, which explains everything clearly in English, not computer talk. In a matter of hours you will be writing your first programs.

'Learn BASIC' is designed for people who want to keep abreast of the computer age, for people who realise that understanding computers is a key to future success at work, at school, and as a parent.

Get 'Learn BASIC' and teach your micro how to be useful! (Available from major branches of W.H. Smiths, Boots, Laskys, Greens, John Menzies and better computer shops nationwide.)



Please send me more information about your:-

(Tick appropriate box)

- 'Learn BASIC' tutorials ☐
 Logic 3 Spectrum Club ☐
 Logic 3 Commodore Club ☐
 (64 and VIC owners only)

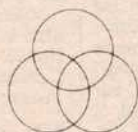
Name
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I have a:-

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 Commodore 64 ☐
 Acorn Electron ☐
 BBC Microcomputer ☐
 Dragon ☐

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..... (Postcode)



LOGIC 3

To Logic 3 Ltd., FREEPOST, Mountbatten House, Victoria Street, Windsor SL4 1HE

Bounds of decency

Your magazine has finally passed the bounds of decency.

I refer to the latest Automata 'advertisement' (September 20 issue).

I realise a full-page ad pulls in a lot of revenue and that a lot of people find Automata funny — but I do not consider putting babies with defects in a mincer to be funny. Perhaps if adverts for software copiers were shown with funnies about cancer you would print them too.

Yours disgustedly,

David Riley
28 Malvern Avenue
Spalding
Lincs

Automata is surely using in its advert the word 'defect' in the context of 'at odds with ideologically a totalitarian state'.

If we felt that an advert was genuinely in unacceptably bad taste then it would not be run, regardless of any revenue considerations such as those to which you refer.

Supply and demand

The idea of low-cost software helping reduce piracy is ridiculous. If a pirate can make a living with normally priced software sold at around half the price to his customers, then the copies of cheap software can equally be sold for half their price. This may not be a vast sum per cassette, but the lower-priced cassettes sell in larger volumes.

Where an individual or a club may purchase one £6 piece of software and copy that, they can buy three at £2 and copy all these.

I feel the only way at present to prevent piracy is to produce cheap Rom software. MSX, (if it catches on) being cassette based, will help the pirates by giving them a market on around a dozen machines with one piece of software. The way reports have it, software houses are happy to convert software for MSX, and do not seem to be worried on this score.

Finally, I have just purchased an Amstrad, and I am very pleased with it except for the price tag of £8.95 for software conversions? The shops are, I would say, cashing in — everything for the Amstrad is £8.95. I very much want to buy software for my machine, but I will not pay these prices.

If the old supply and demand theory applies, as far as I am concerned, there will be no demand from me until the prices fall.

K A Prince
22 Hanger Rd
Tadley
Hants

White to blue

I was typing haphazardly on the keyboard of my Commodore 64 when suddenly the cursor turned from white to blue and the machine locked up.

Knowing that I had not touched the control key I set about trying to find a cause. After much experimentation I discovered that the effect could be obtained by holding down the Commodore key together with the ; and = keys.

Is this a new Commodore 64 bug?

Sarah Cotton
Studely
Warwickshire

Muddled letter

Somewhere between my source file and your typesetting, my letter printed in the September 13 issue became rather muddled.



In the second paragraph, I meant to say that Goto statements are superfluous except in error trapping, and that structured programs are easier to write, debug and follow.

Peter Bhagat
Clare College
Cambridge

Manual intake

Newcomers to more advanced computing who have bought the Amstrad CPC464 — and there must be thousands of them by now — may be interested to know that in the instruction manual in Chapter 8 (the concise reference guide) there is an omission.

Namely the keyword *Mod*. This is not listed in the chapter at all. The *Mod* keyword gives the remainder from a division sum. For example, 10 Mod 3 gives the answer 1 since 10 - 3 * 3 = 1.

P J Long
3 Victoria Place
Bedminster
Bristol

Talk to each other

You deserve full marks for your QL page as it makes your magazine the only one worth reading! *QL User* and others don't get off first base when they fail to publish such stunning programmes as Richard Snowdon's utility for writing and editing programs on the word processor!

Having received my QL fresh from the factory with its new Rom I am anxious (like many others I suspect) to see what it can do when connected to a Spectrum. Please can you tell me if any interface is required as Sinclair, by supplying a network lead, imply this is not so. However, all attempts to get a QL and Spectrum to talk to each other have failed for me so far. There must be a magic combination of commands that will stop me tearing my hair out. Can someone help?

J C Cabrie
96 St Kingsmark Avenue
Chepstow
Gwent

Special Tape Offer—Week 3

Only £1.50

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All you have to do to get your copy of the Nightmare Planet text adventure written by Mike Grace is cut out the coupon below, fill it in and send it off with a cheque or postal order (made payable to Sunshine Publications) and the three special vouchers from this and the two previous weeks to: 'Nightmare Planet Offer', Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD. The offer is open only to residents of the UK and Eire and the offer closes on November 4. Please allow 28 days for delivery.

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Nightmare Planet Adventure

on the Commodore 64

3

PLEASE NOTE: If you are sending off for last week's Hewson Consultants discount tape offer, please mark your completed coupon with the machine for which you want the program.



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- Plot radians from a point!
- Move objects around!
- Copy shapes!
- Create mirror images!
- Zoom in on an area!
- Swap shapes between two pictures!
- Save your pictures to disk or tape!

The program is controlled entirely from the tablet by moving a cursor arrow around to the different menu option. An optional Programmers Guide is also available to tell you how to incorporate Koala Pad pictures into your own programs.

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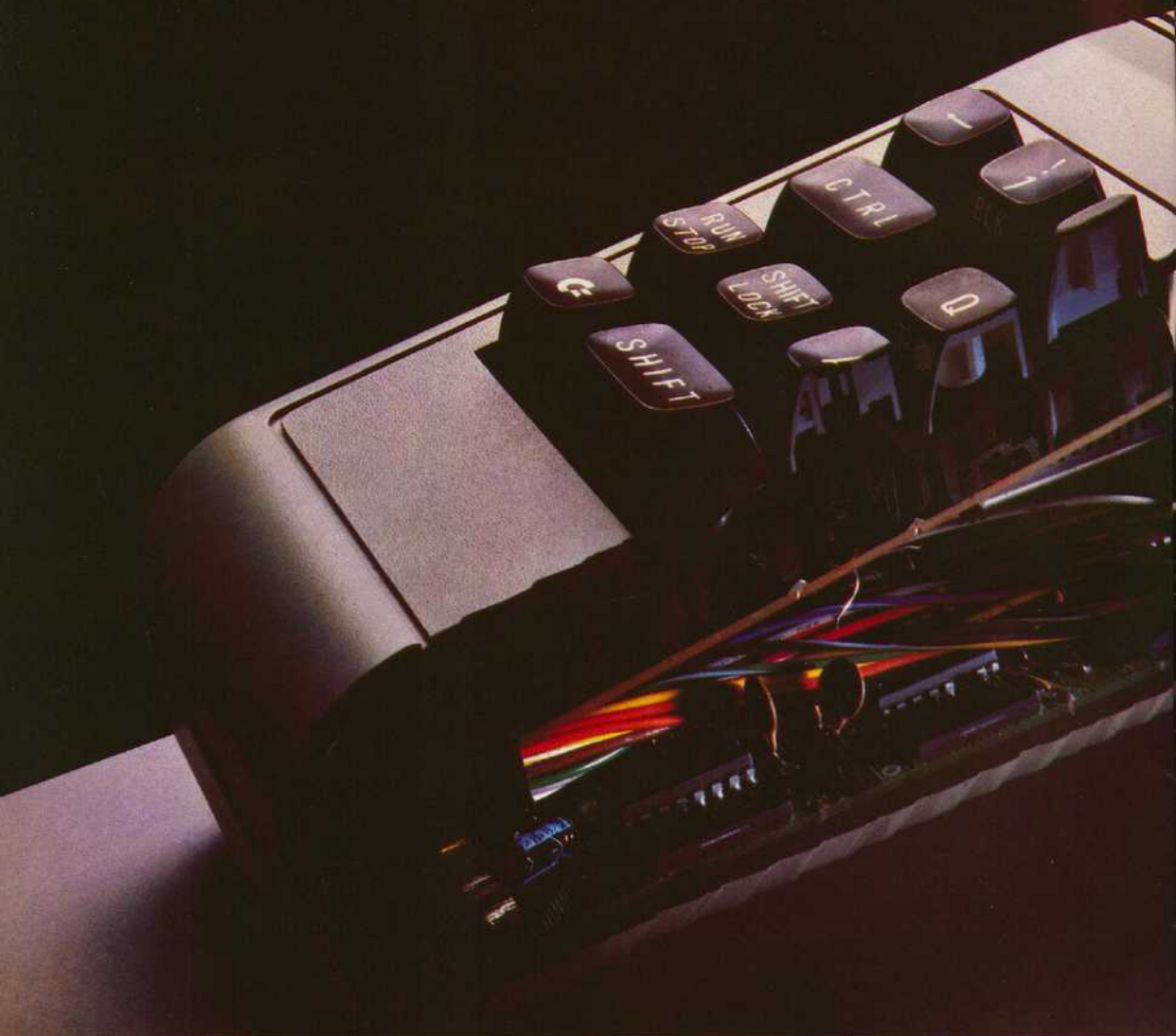
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Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain barely ticks over.

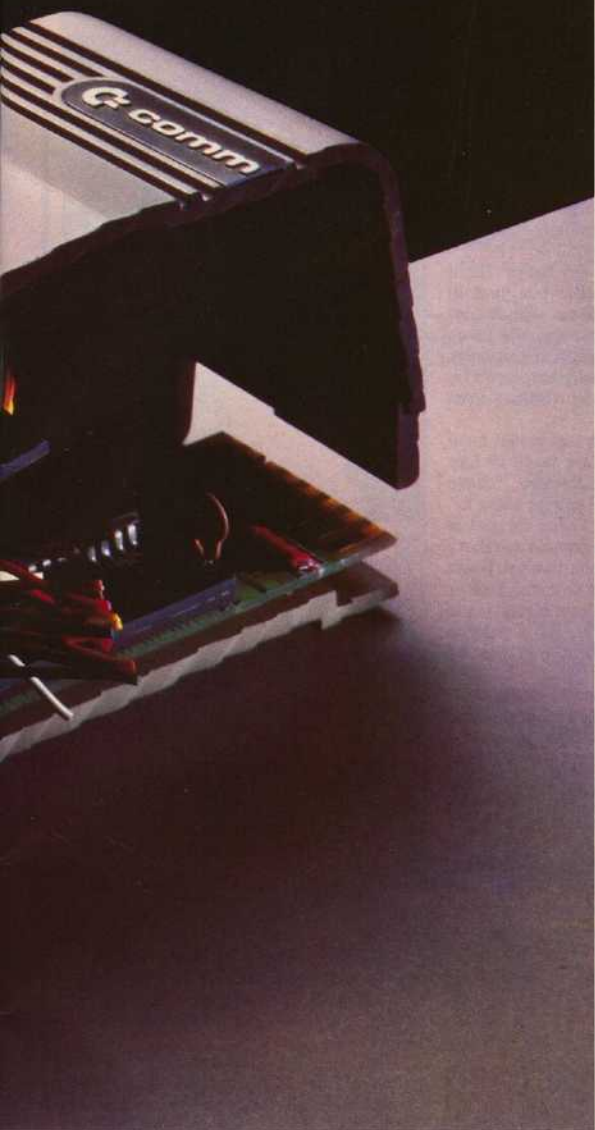
To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

And for those you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory.

Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

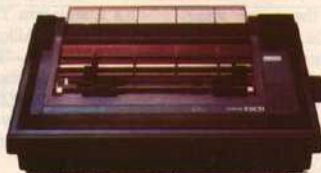
For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.



COMMODORE MPS801 ☐
Dot matrix printer: £230.00.
Tractor feed. Print speed:
50 characters per second.



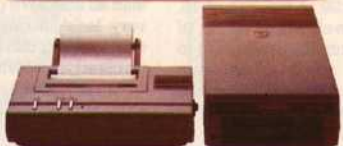
COMMODORE MPS802 ☐
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60 characters per second.



COMMODORE MCS801 ☐
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38 characters per second.



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COMMODORE 1520 ☐
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COMMODORE 1541 ☐
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16 and Commodore plus/4.



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Shooting a line

Graham Taylor talks to Tony Crowther of Gremlin Graphics

If you own a Commodore 64 the chances are you'll have at least one game by Tony Crowther.

If you don't recognise the name you'll certainly recognise the style. Tony's games are distinguished by striking graphics and incredible attention to detail.

These features coupled with sheer arcade pace and addictiveness have ensured that games like *Loco*, *Blogger*, *Potty Pigeons* and now *Suicide Express* are sure chart winners.

Tony is an unconventional programmer in many ways. Although young enough to be designated a whizz kid his attitudes towards the industry and to his own work are matter of fact — dismissive, even. His comments mix a kind of amiable arrogance and genuine modesty in about even measures.

Starting with the Vic20 at the age of 16, Tony travelled the well-worn route of learning Basic and eventually graduating to machine code. With much in common between the Commodore machines the move to the more powerful Commodore 64 when it arrived was inevitable.

The first Commodore program to achieve any fame was *Blogger* from Alligata Software. I cautiously suggested that — with its platforms and jumping — it was a little like *Manic Miner*, expecting a stream of denials and illustrations of all the ways in which it was absolutely the opposite. I didn't get it.

"Well, one of my friends saw *Manic Miner* and liked it and suggested I should do something similar — so I did." *Blogger* may

ensure that he is probably still more associated with that company than his current one, Gremlin Graphics.

It's a situation Tony is not happy about since he left Alligata earlier this year in some acrimony. "They hit me with a new contract during my employment with them. Basically it meant that I would only receive royalties whilst I was actually employed by them — I'm not getting any royalties from Alligata now."

Although it's a situation that would have most people gnashing their teeth in fury Tony seems fairly indifferent. "There doesn't seem to be much I can do about it."

On to happier matters. Those amazed at the detail in Tony's games assume that there must be some magic secret to it all. Some brave new programming wonder greater than all that have gone before. Surely, at the very least, a quarter of a million pounds worth of Vax development system must be involved somewhere?

"Oh no, there are no special techniques at all, really," says Tony. "I just jot a few things down and put them into the computer." I tried again. Surely all that smooth scrolling and pixel by pixel detail requires something well, exotic and special. "It's all user-defined graphics," said Tony.

User defined graphics didn't have the same ring to it as modal vectors. Did Tony mean regular, common or garden, user-defined graphics as used for nasty blob things supposed to be bombers and



the background consist of vast numbers of user-defined graphics which are relatively scrolled. Using characters to scroll as a screen instead of the high-res screen costs only 1K." That's it.

Relative scrolling is a technique where there are 'levels' of background which scroll in the same direction but at different rates. "I got the technique from *Forbidden Forest*."

With the puffing steam train in *Loco* and the 'sweet' plot of *Potty Pigeon* in which your pigeon has to collect twigs for its nest, I wondered if Tony had a deliberate policy of producing non, or at least less, violent games.

"Well, I suppose they are a bit cuddly but with *Potty Pigeon* in particular I was just messing about and that's what turned up. Actually I'm getting a bit bored with those sort of games with a large playing area, I fancy doing a shoot-them-up where you get to kill things — I've never done one." Sigh...

What about the cartoon-quality of the graphics found in his games? At times the display could almost be mistaken for a film — did he have any special artistic background? "No." Another theory in tatters. "Well — I do have an A level in technical drawing."

I ask Tony what other games he admires. "I don't look much at other games."

What is Tony working on now? "Well, with *Suicide Express* I think I've pushed the Commodore 64 to its limit in terms of the style of game people associate with me — I'll be doing some things for the BBC, I think I can get games out of it at least as good as those on the Spectrum. I'll use mode five — I'm used to working in three colours."

He's right about *Suicide Express* and not only in terms of technical achievements — the whole game has an atmosphere, a sense of speeding relentlessly through the night, that makes it really special.

If I'd mentioned this to Tony he'd probably have said it was because there was a lot of dark blue and black in it.



have taken a mild slugging from critics crying 'rip-off' but it was still a good game to play and it made the charts.

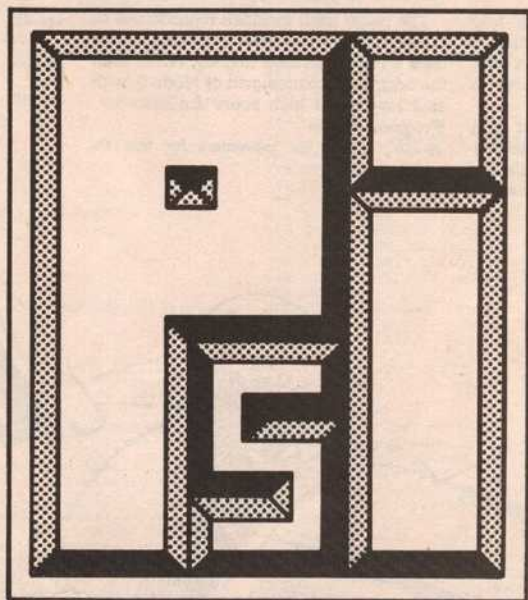
Tony produced other games for Alligata, *Killer Watt*, *Son of Blogger* and *Loco*, the latter two released recently enough to

nasty square things used to make blocks in skyscrapers in endless versions of *Blitz*? He did.

"With sprites you are limited in what you can do by the number of sprites, I only use them for foreground effects. All the detail in

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WARRIOR

ORIGINALITY 10 • ORIGINALITY 10 • ORIGINALITY 10 • ORIGINALITY 10

GRAPHICS 10 • GRAPHICS 10 • GRAPHICS 10 • GRAPHICS 10 • GRAPHICS 10

SOUND 10 • SOUND 10 • SOUND 10 • SOUND 10 • SOUND 10 • SOUND 10

LASTING INTEREST 10 • LASTING INTEREST 10 • LASTING INTEREST 10 • LASTING INTEREST 10

ANIMATION 10½ • ANIMATION 10½ • ANIMATION 10½ • ANIMATION 10½ • ANIMATION 10½

OVERALL 11 • OVERALL 11 • OVERALL 11 • OVERALL 11 • OVERALL 11 • OVERALL 11

COULD IT EVER HAPPEN?

Helicopter fury

Test your nerve and skill in a version of *Bomber* written for the Amstrad by David Channon

You are a budding helicopter pilot entrusted with the vital mission to raze the enemy headquarters (disguised as a seemingly innocent city) to ground.

You have already battled your way through the enemies defences, and suddenly realise that the outcome of the battle is in your hands... but you are running out of fuel.

The game itself includes realistic use of colour and all three sound channels. It also uses a high resolution display, rather than the normal 20 column grid of Mode 0, with skill levels and high score facilities.

Program Notes

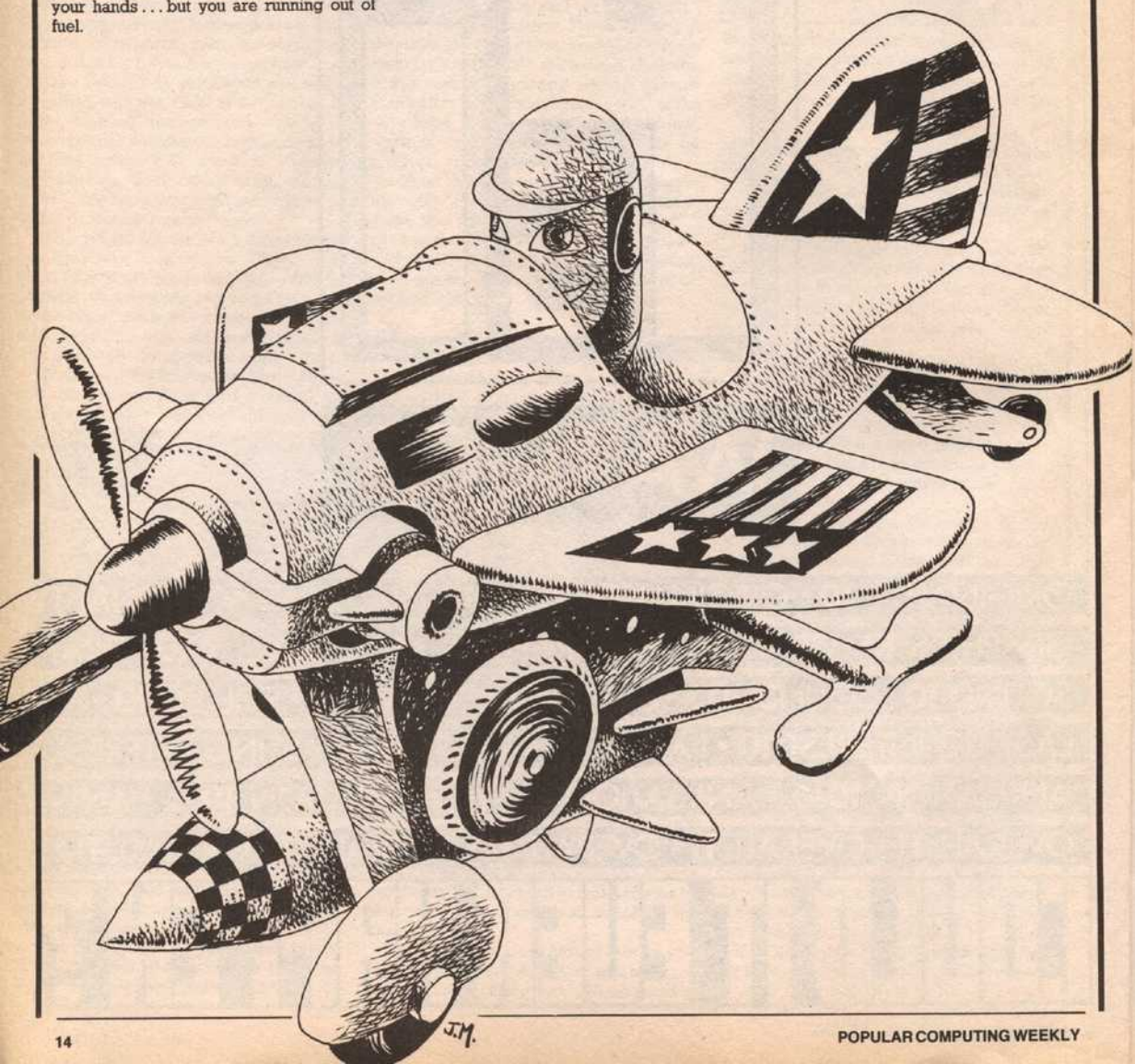
10-110 Helicopter movement for title sequence.

120-210 Bomb drop and letter print for title sequence.

220-360 Instructions.

380 Sets rotor blade sound.

400-510 Main loop for ship movement as well as key and joystick read routine.




```

10 REM BOMB DROP
20 REM Program for Amstrad CPC 464 by David Channon
30 REM title screen
40 ENV 1,1,1,3:ENT 1,100,-2,3
50 INK 1,0:INK 0,14:BORDER 14:RESTORE:MODE 2:CLS:GOSUB
790:TAG 60 ENV 2,100,1,1:SOUND 4,200,-32767,7,2,0,5
70 FOR n=0 TO 650 STEP 4
80 MOVE n,300
90 CALL &BD19:PRINT CHR$(254):CHR$(255):
100 IF n=200 OR n=216 OR n=232 OR n=248 OR n=312 OR
n=328 OR n=344 OR n=360 THEN GOSUB 130
110 NEXT
120 TAGOFF:LOCATE 1,21:FOR n=0 TO 16:PRINT CHR$(7):NEXT
:MOVE 200,376:DRAW 166,0:GOTO 230
130 FOR f=290 TO 200 STEP -2
140 MOVE n,f
150 SOUND 2,400-F,3,7
160 CALL &BD19:PRINT CHR$(252):
170 NEXT
180 MOVER -0,0:PRINT CHR$(238):CALL &BD19:MOVER -0,0:
READ a:PRINT a:
190 RETURN
200 DATA B,O,M,B,D,R,O,P
210 REM Instructions
220 WHILE INKEY<>"":WEND
230 LOCATE 1,4:PRINT "You are a budding helicopter pilot
with a mission to destroy an enemy city ."
240 WHILE INKEY<>"":WEND
250 PRINT:PRINT "which intelligence tells you is no city
at all but a headquarters for designers"
260 PRINT:PRINT "of a revolutionary new nuclear device
which could be a turning point of the war."
270 PRINT:PRINT "you are running out of fuel and descend
gradually . with enough fuel to enable "
280 PRINT:PRINT "you to rise twice in each game."
290 PRINT:PRINT "A crash into a building is fatal, and
only the total destruction of the city "
300 PRINT:PRINT "would prove a successful mission...."
310 PRINT:PRINT "Pressing the large 'ENTER' key or
moving the joystick up will allow you to rise."
320 PRINT:PRINT "Press the 'SPACE BAR' or normal JOYSTICK
fire button to drop you bombs but"
330 PRINT:PRINT "remember guidance computers will only
allow one bomb in the air at a time..."
340 PRINT:PRINT "PRESS 'SPACE BAR' TO CONTINUE."
350 IF INKEY="" THEN 360 ELSE 350
360 SOUND 1,400,25,7:INK 1,24:INK 0,1:BORDER 1:GOSUB
1160:GOSUB 870:GOSUB 660
370 TAG
380 ENV 2,100,1,1:SOUND 4,200,-32767,1,2,0,2:REM chopper
blade envelope
390 uf=2
400 FOR v=389 TO 20 STEP -16
410 FOR h=0 TO 600 STEP 16
420 MOVE h,v
430 CALL &BD19:PRINT CHR$(254):CHR$(255):
440 IF TEST (h+65,v-16)<0 THEN 750
450 IF f1=0 AND INKEY(47)=0 THEN f1=1:GOSUB 1040
460 IF f1=0 AND JOY(0)=16 THEN f1=1:GOSUB 1040
470 IF uf<0 AND (INKEY(10)=0 OR INKEY(72)=0) AND v<357
THEN MOVE h,v:PRINT " "
480 IF f1=1 THEN GOSUB 1080
490 NEXT h
500 MOVE h,v:PRINT " "
510 NEXT v
520 SOUND 132,0:REM stop blade envelope
530 REM Game won
540 SOUND 1,200,100,7,1,1
550 MODE 2
560 ps=er:ps:eo=eo+2:IF eo>20 THEN eo=20
570 IF ps>hs THEN hs=ps:INK 1,26:PEN 1
580 PRINT "Congratulations you achieved a score of "ps
590 IF hs=ps THEN PRINT:PRINT:PRINT "You even made
the highest score so far."
600 f1=0:z=1:er=ps:PRINT:PRINT "You are now to use
u another ty so be ready to improve your score....."ps=0
610 PRINT:PRINT:PRINT "Press 'SPACE BAR' to
continue your game."

```

```

620 WHILE INKEY<>"":WEND
630 IF INKEY<>" " THEN 630 ELSE GOSUB 870:GOSUB 790:GOSUB
660:GOTO 370
640 STOP
650 REM Set up buildings
660 MODE 0
670 FOR n=3 TO 19
680 a=INT(RND*5)+eo
690 PEN INT(RND*12)+4
700 FOR f=25 TO a STEP-1
710 LET p=ps+f
720 LOCATE n,f
730 PRINT CHR$(253)
740 NEXT f
750 LOCATE n,a-1:PRINT CHR$(250):PEN 3
760 NEXT n
770 RETURN
780 REM Graphics
790 SYMBOL AFTER 249
800 SYMBOL 254,4,14,4,7,3,0,0,0
810 SYMBOL 253,127,107,107,127,107,107,127,127
820 SYMBOL 255,254,16,124,246,254,124,73,254
830 SYMBOL 250,8,28,62,127,107,107,127,127
840 SYMBOL 251,0,97,107,127,107,107,127,127
850 RETURN
860 REM Set up pen colours
870 FOR c=4 TO 15
880 INK c,(c+10)
890 NEXT c
900 INK 1,16:INK 2,17
910 INK 3,9
920 RETURN
930 REM Crash
940 WHILE INKEY<>"":WEND
950 SOUND 132,0:SOUND 1,RND*600,10,7,1,1,5:SOUND 2,RND*27
,20,7,1,1,7:SOUND 4,RND
*600,80,7,1,1,3
960 MOVE h+20,v:PRINT CHR$(238):CHR$(238):
970 SPEED INK 1,1:BORDER 15,16:FOR p=0 TO 100:INK 0,
RND*26:NEXT p
980 TAGOFF:INK 0,1:BORDER 1:CLS
990 MODE 2:INK 1,26:PEN 1:IF z=1 THEN PRINT "You weren't so
lucky this time so your score remains"er
1000 f1=0:IF z=0 THEN PRINT:PRINT:PRINT:PRINT "You need
some practice you were killed so achieve a score of 0"
1010 PRINT:PRINT:PRINT:PRINT "Press 'SPACE BAR' to start
another game."
1020 IF INKEY<>" " THEN 1020 ELSE 1030
1030 z=0:ps=0:GOTO 360
1040 REM Bomb drop
1050 g=h:b=v-16
1060 IF g/32<INT(g/32) THEN g=g+16:t=b-280:c=b
1070 PLOT 620,620,3:MOVE g,b:PRINT CHR$(252):t=b-16:MOVE
g,b+24:PRINT CHR$(32):
PLOT 620,620,1:RETURN
1080 LET b=b-8:PLOT 620,620,3:MOVE g,b:CALL &BD19:PRINT
CHR$(252):t=b+16:PRINT CHR$(32):PLOT 620,620,1:SOUND
1,5,7:c=c+1
1090 IF b<0 OR b<t THEN f1=0
1100 IF TEST (g+10,b-16)<0 AND b<t THEN PEN 3:MOVE g,b:
PRINT CHR$(251):RETURN
1110 IF TEST (g+10,b-16)<0 THEN SOUND 2,c+200,5,7
1120 IF b<0 THEN MOVE g,b:PRINT CHR$(32):SOUND 2,100,
10,7,0,0,5:FOR p1=1 TO 3:OUT &400,4:OUT &100,39:FOR p=0 TO
10:NEXT p:OUT &400
,4:OUT &100,38:FOR p=1 TO 8:NEXT p:NEXT
1130 IF b<t THEN MOVE g,b:PRINT CHR$(32):
1140 RETURN
1150 REM Difficulty
1160 MODE 2:CLS:PRINT "Enter the difficulty you wish to
attempt (1-3) ? " :c=c+1
1170 k$="":WHILE k$=""k$=INKEY:WEND
1180 IF k$="1" THEN eo=20:SOUND 1,200,25,7:GOTO 1230
1190 IF k$="2" THEN eo=15:SOUND 1,400,25,7:GOTO 1230
1200 IF k$="3" THEN eo=10:SOUND 1,600,25,7:GOTO 1230
1210 eo=eo-2
1220 GOTO 1170
1230 CLS:PRINT "Press 'SPACE BAR' to start"
1240 IF INKEY="" THEN 1250 ELSE 1240
1250 SOUND 1,400,25,7:CLS:RETURN

```


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Hardware Review

Duck shoot

System Compunet **Micro** Commodore 64, plus Commodore modem **Price** Commodore Communications Modem £99.99 **Supplier** Commodore Business Machines (UK) Ltd, 1 Hunters Road, Weldon, Corby, Northants.

Yes, it's finally happened. A mere six months after eager buyers ordered their first CBM modem for the special "Compunet" service at the Pet Show, Compunet itself has actually come into visible existence. Now that the proud owners of the modem can use it for something other than rival Prestel, just how does the new service measure up to its claim to be "arguably the most sophisticated interactive database yet set up for home computer users"?

As of this moment, I have to report that Compunet has yet to fulfill such high hopes, although there are signs that, within the very near future, it might get a great deal more exciting. The problem is that, although there are a number of pretty and intriguing entry pages for various sections, many of the sections themselves are not yet up which, after all the time taken to launch the system, is rather a pity.

The modem itself is a substantial black box, which plugs into the cartridge port, with a cable for the telephone jack. That's the lot. Just plug in the modem, switch on the

CBM 64 and there you have an opening screen telling you that you have 30719 bytes free. Registered users have an ID and password which are used after typing the command *Connect* plus the telephone number of the nearest access node. The modem dials for you, the screen changes colour to show that you are being connected and, once you have identified yourself, you're in.

The ID will be particularly important once Compunet is running properly since each individual ID is programmed into the modem. Thus, if you download priced software, it will be direct-debited to the owner of the ID for the modem, according to an agreement signed by the user when registering. Registered users will also be able to use an electronic mail system, the Comp-U-Card credit card electronic shopping service, and, one of the major new features of this service, upload programs and text frames to specified parts of Compunet.

My brand-new package came without the special user manual, which gave me the opportunity to test the claims that the Compunet routes and onscreen facilities were self-explanatory. The system works through a series of directories each with a "duck-shoot" menu (options on a status line at the bottom of the screen which are selected by cursor and implemented via *Return*) and a "bar" at the top of the directory which can be moved over the selected item. Once the subject is highlighted, options on the duck-shoot menu such as *show* (to display the frames), *print*, etc, can be used.

The explanatory frames are reasonably

full. Items displayed this way have a separate duck-shoot menu giving the choice of displaying continuously, frame-by-frame, or exiting to the directory. The main duck-shoot lets you select a particular area through *Goto*, move "back" to the last directory and has a variety of instructions covering uploading, downloading, saving frames and how to "edit".

Uploading of user's own software will take place to the "jungle" area, which is a users' playground of messages, tips and programs for sale. You can specify how long you want your program, or message, stored in the jungle and you will be charged accordingly. The life of any such item can be extended by the user if required.

Seasoned Prestel users will find the frames rather slow, since the modem implements full error-checking through the Packet Switching System, and it can take up to 10 seconds before a frame starts displaying. On the other hand, Compunet say that there is no chance of corruption from line noise, something that has a nasty tendency to play havoc with "mailbox" operations on Prestel. The few graphics pages already up on Compunet are of far higher quality than those on Prestel, since they make better use of the 64's facilities.

The system is flexible, and will allow user-to-user contact as well as videotext emulation for Prestel and other 1200/75 baud systems. As of the moment of writing this review, Compunet is providing very few thrills after the first tour of the directories. But the potential for it to do so is clear.

Barbara Conway

Double strike

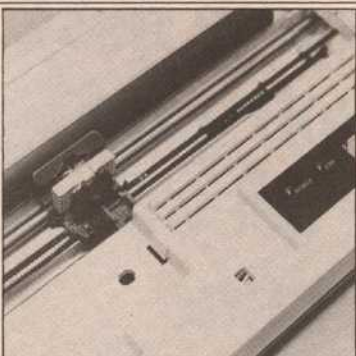
Hardware M-1009 dot-matrix printer **Micro** Any Centronics or RS232 machine **Price** £199 **Supplier** Brother, Shipley St, Guide Bridge, Oldershaw, Manchester.

Most home computer users, sooner or later, feel the need for a printer. The biggest problem is cost. Cheap printers often use expensive paper, give copy that fades and is unacceptable for letters. Yet, if you want to do anything other than list programs, then you could pay more than the price of your computer.

The new printer from Brother — the M-1009 — costs about £200, but has a number of features that make it more than a stripped-down budget model.

For a start, it takes A4 sheets of plain paper and optional extras include both a roll and a fan-fold feeder and, the nine-pin print head gives characters that are clear although obviously the product of a dot-matrix device.

I hooked up the Brother to a Spectrum, via a Kempston interface. Once the necessary software modifications were made, the first test was to print out a 40,000 word book, written on Tasword Two. The printer beha-



ved impeccably, and was also quick: a sheet of double-spaced A4 took about 50 seconds.

The low-cost of the machine is to a certain extent reflected in its construction: only two screws hold on the top cover which wobbles. The print mechanism is solid enough, although the paper release lever felt a little flimsy. A row of easily accessible dip switches allow changes in the hardware configuration. The model I tested was equipped with a Centronics interface, but RS 232 is an optional extra. This supplements the parallel input; you may switch between the two — a good investment if you

are likely to change computers in the future.

There are a number of software options on the M-1009: underline, enlarged, condensed, double strike, super and subscript which let you ring the changes, and some modes can be mixed. Bit image printing can be achieved, but I had problems stemming from my interface which expands Sinclair keywords. A dose of machine code should solve this.

Operating the printer is simple. Two membrane keys force line-feed and switch the printer on and off line. An LED indicates errors. If a problem occurs the printer switches itself 'off-line'. Printing is logic seeking and bi-directional, which makes the machine very time efficient. Loading a sheet of paper is a bit fiddly though. Even after a hundred pages I could not avoid putting a dot on the top edge of the paper as it passed over the print head.

The manual is a classic example of bad translation and strange idioms cloud the meanings of many important sentences. Fitting the ribbon cassette, for example, is very poorly explained.

Despite these small quibbles, though, I rate the M-1009 as very good value. Unless you want daisy-wheel quality, it will cope with most needs, and should give sterling service for many years.

Jeff Naylor

Kentech

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Is Vic there?

Andy Pennell looks at Commodore's latest bid to capture the budget micro market from the Spectrum—the C16

After years of speculation about its death, the Vic20 is now officially obsolete, replaced by the Commodore C16. The C16 comes in a starter pack, similar to the Vic, consisting of dedicated cassette deck, and four software packages, for £139.99. The 16 in the name refers to the total Ram available, though like the 64 the amount of user Ram is considerably less.

It looks just like any other Commodore machine, in the same case as its predecessors, though in a different colour scheme—the case is dark grey, and the keys light grey. The keyboard itself is of the usual Commodore standard, with decent, angled, keys, though the layout is non-standard, even compared to its predecessors. If you've got used to the positions of keys like *, +, Home, and the all important cursor keys on the 64, then you will have great fun on a C16, as they're all swapped about. I personally find CBM keyboards a little too soft, but typing is a personal thing. It's funny, though, that Commodore can put a decent stepped keyboard on a £140 C16, but Sinclair can't put more than a flat rubbery thing on the £400 QL.

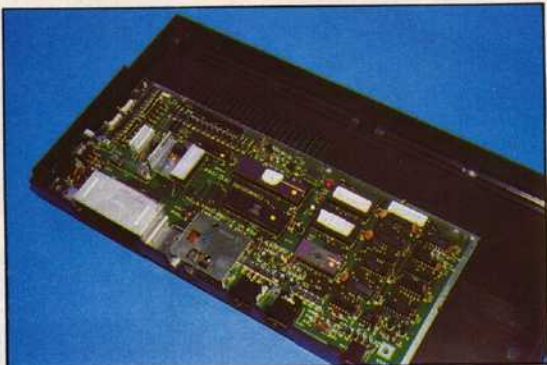
Inside the machine is a smallish circuit board, leaving quite a bit of empty space. The American origins of the machine are immediately apparent, from the metal screening all over the circuit board. In the USA, there are certain legal requirements for radio interference, but there are no such laws in the UK, so British micros usually drown out the average radio in the same room. There are few components on it, the main ones being the 7401 processor and the custom chip that does the clever stuff like producing a TV display. What is this 7501 processor I hear you ask? Well, it's just

another Commodore version of the illustrious 6502, as the 6510 was in the 64.

On the C64, with its 'elephantine' 64K of memory, when you switch on you get a message saying something like '39K bytes free'. The remaining 26K is used up by the system, so about 40% is unavailable in Basic. On the C16, with 16K Ram, you get about 12K free, which isn't bad. However, the moment you select one of the higher graphics modes, another 10K of memory goes down the tube, leaving you with under 2K user Ram, less even than the Vic20. This I feel is the major shortcoming of the C16—the lack of memory. On the 16K

Spectrum, about 8K is left to the user, which is quite enough for many uses, but designing a 10K screen for a machine that has only 16K is a major oversight by Commodore. It was supposed to be technically possible to expand it up to a Plus/4 and

necessity to buy one of the many 'extended Basics', either Simon's Basic from Commodore themselves, or one of the independent programs. Well, on the C16, Commodore have killed off that piece of the market, as Basic version 3.5 is supplied with the machine, which has all the extra commands



you'd expect on any other machine.

The Basic sits in 32K of Rom, along with the kernel, which looks after the whole machine, and a machine-code monitor. The Basic is Microsoft as you'd expect, but in the same funny Commodore dialect used before. Programs are edited using the same screen editor as before, but with the addition of a few welcome features such as automatic insert mode. The same PET-type graphics characters are available, and the function keys are initially configured to produce various key sequences.

The default commands are a little strange, being mainly concerned with the disc drive, and as most users would not have a disc drive, but the supplied cassette recorder, they seem an odd choice. Anyway, if you don't like them, the Key command re-defines them to be anything else—no Pokes necessary on the C16. For entering programs there are a few other commands, like *Auto* and *Renum*, which are again new to CBM owners. Fans of 'structured programming' will not be impressed by it, it's only such features being *Do... While* and *Do... Until*, with no procedures or long functions.

By pressing the *Esc* key followed by another, various extra functions can be invoked, the most interesting of which are the 'window' commands. Windows are one of the in-things at the moment, and have appeared on the Amstrad and QL, and now the C16. However, you can have only one window at a time, so it's not really in the same league as the others mentioned. I believe a similar effect can be obtained on the C64 by *Poking* anyway. Regrettably there is no *Window* command, so to the

Commodore dialect

onwards to 128K, but don't hold your breath waiting for Commodore to do anything soon.

It has been the hallmark of previous CBM machines that the Basic didn't support any of the machine's best features, such as graphics and sound. It practically made it a





process of defining a window has to be done by a tedious sequence of control code printing.

The C16 has five graphics modes. The simplest is test mode, with the usual 40 by 25 lines of text, with each letter able to be a different colour. This is the only one that doesn't take up the extra 10K of memory. In text mode, there are 15 different colours, each with 8 levels of luminance, and black, effectively giving 121 different shades, all of which can be displayed at once.

There are also two high-res modes, one with a 4 lines of text at the bottom of the screen, and one without. In high-res the resolution is 320 by 200, which is about average nowadays, though there is a colour restriction—you can only have two colours in one 8x8 pixel character square, the same as the Spectrum. However, you can still have 121 different colours at once. The two remaining modes are 'multi-colour' modes, which have a resolution of 160 by 200, but can have up to four different colours per character square, still with the choice of 121 colours. The main thing missing on the C16 compared with the 64 is sprites. Undoubtedly the best feature of the 64, they made it much easier and faster to write games for the 64, as the programmer didn't have to bother about the mechanics of actually putting shapes onto the screen and removing them later, as the hardware did it all.

Five graphics modes

They are not present on the C16 though, which is a sad loss, and it will make it harder to write quality games for it. The Spectrum programs show that attribute problems can be overcome by skillful software, but it has taken a few years to work it out.

Controlling the graphics from Basic is easy, with commands like *Draw*, *Locate*, *Box*, *Circle* and *Paint*. The *Circle* command doesn't just draw circles, but can produce ovals, arcs, or any kind of polygon. The

Char command is a sort of *Print At* command, that works in any graphics mode, and *Paint* is a way of filling in areas with solid colours. The speed of the graphics generally, and especially the filling,

is positively slothful when compared with the speed of the QL, and is a good demonstration of the difference between an 8-bit chip like the 6502 and the 32-bit 68008. The Basic itself is a little slower than previous CBM dialects, but, of course, not as slow as the Spectrum.

The sound facilities of the C16 are not

half as good as the 64s, but are still adequate. There are two voices, one for notes, and one for notes or noise, with overall control. There may be more features, but they are not accessible from Basic, and as the *Programmers Reference Guide* has not yet appeared, I can't say. As it gets piped through the TV, volume is not a problem.

The built-in machine-code monitor is not earth-shattering, but it's better than nothing. It has a one line assembler, disassembler, and various memory read and write modes, though it doesn't have single stepping. It seems to have code *Save* and *Load* commands via the cassette recorder (and not disc), but I can't be sure as I had no instructions at all for the monitor.

The C16 comes with its own dedicated cassette recorder, which seems to be the same as the usual one, except that it has a different plug. The tape format is the same slow one as before, so the market for turbo loaders remains for the C16. It also connects to the infamous 1541 disc drive, notorious

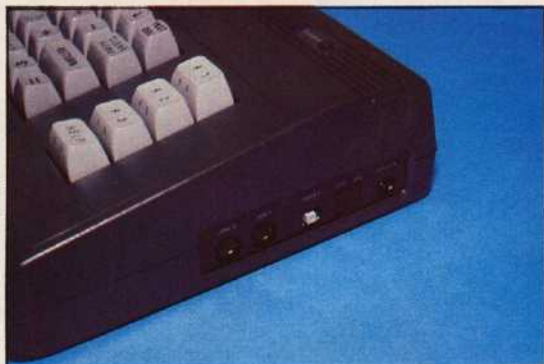
for its incredible slowness, but also supports the new disc drive, up to four times faster, but not yet available.

The Basic has various commands to control the disc drive, including various back-up procedures, and a *Directory* command. While other users may think it usual, this latter feature is innovative on a

Marketing muscle

Commodore. On the C64 and Vic20, getting a directory of a disc involved wiping whatever program currently in memory, but now you can be like everyone else and display your discs contents without losing your program.

As with the QL, the 'joystick' sockets on the C16 are a con by Commodore. Instead of the usual Atari-type sockets, it is cursed with two strange looking mini-din type sockets, so you can't actually plug anything into them. Well, nothing except Commodore's own, forthcoming, 'super joysticks' that is. They aren't much different to the normal run-of-the-mill switched ones.



The documentation supplied with the review machine was very much pre-release, consisting of a couple of hundred photo-copied sheets. What was there was good, though some of the listings were inaccurate. The C16 will be supplied with four cassettes, but these, too, were unavailable for review.

The C16 competes directly with the 48K Spectrum and the Oric. Its advantages include the supplied cassette recorder, good keyboard and better graphics, while its disadvantages are the small amount of Ram and, for now at least, dearth of software. Conversions from the C64 are going to take time, because of the lack of sprites and minimal user Ram, though Vic conversions will be easier.

If it had 16K Ram more then it would be certain to do well, but as it stands it does not have enough for much programming, though Commodore's marketing muscle will ensure it sells.

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A clue

Program Valkyrie 17 Micro
Spectrum Price £9.99 Supplier
Palace Software, 275 Penton-
ville Road, London N1.

Valkyrie 17 is an adventure game by The Ram Jam Corporation. A new independent software group being marketed by Palace.

It's an adventure game unlike any other — but less for technical reasons than approach. It's definitely different.

The plot of the game involves having to prevent the construction of a super weapon by a group of old Nazis.

You begin the game in a bar in the company of a lady with a thick German accent. Could she be a clue?

From here on things are alternately confusing and funny. You'll probably spend ages trying to get out of the hotel — it seems the manager wants you to pay your bill.

The game understands relatively complex sentences although balks at conjunctions eg, *Take Gun and Take Robe and Wear Robe*. The graphics are reasonably detailed and above all, quick. No waiting around for ages here.

Removing the boring bit might be a maxim for the game actually. Once you've grasped the basic way of solving a problem the computer recognises the fact and lets you get straight on. For example, supposing at one point you need to tie sheets together to get out of a window, as soon as you've got as far as *Tie Sheets* it says "the sheets are tied together hanging out of the window". No messing around trying to find the right words: *Go to Window, Tie Sheets to Window*, etc, etc.

This sort of thing improves the play massively though it may not appeal to the more literally minded people.

The game is witty, clever and slick. There are over a hundred locations and a similarly sized vocabulary. Lots of clever use of sound effects for telephones which may sometimes be usefully answered. Also some mysterious thumping... I liked it a lot.

Ian Waltham



Analysis

Program Forecaster Price £15
Micro BBC B Supplier Brain
Power, Triptych Publishing Limited, Sterling House, Station road, Gerrards Cross, Bucks SL9 8EL.

Forecaster by Kevin McKeogh and Stuart Armstrong is not a toy or a glorified garden fete clairvoyant. It is a practical tool for people who need to establish trends in business or other activities.

The program offers several forms of statistical analysis and can cope with fair quantities of data. There is a substantial handbook which reminds

you that it is necessary to think fairly hard about the information you want to find and which pieces of input will help. You can print and save analyses, but note that the cassette version only saves to tape and the disc to disc. It is well worth saving your raw data once entered and before processing. Certain combinations can crash the program by taking calculations outside the limits of the micro.

The value of this package is that it includes as a bonus a very useful instruction cassette which with the first section of the handbook gives a clear, well-written explanation of the processes involved. It is not easy, but it is straightforward and written for the non-technical person, so with pa-

tience everyone can appreciate and use the system. The package would probably be worth its price for the teaching section alone — as a combined deal it can be warmly recommended.

Dave and Jan Watterson



Musical

Program Music Master Micro
Commodore 64 Price £17.95
Supplier Supersoft, Winchester House, Canning Road, Wealdstone, Harrow, Middx.

Given the excellent sound facilities on the Commodore 64, it's no surprise there are any number of composing programs available; some claim to be composers, others claim to be synthesizers, a few are supposed to be both.

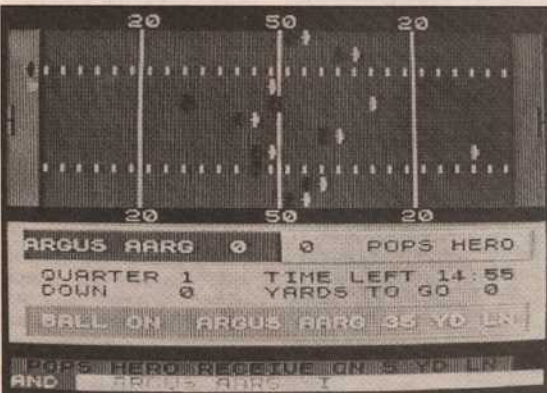
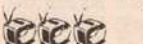
Music Master is the musical equivalent of a word processor and is intended for those with no musical knowledge whatsoever. Rather like those easy-to-play portable keyboards, the program begins with some demonstrations and some presets for electric piano, drum and clarinet which can be used separately or together.

The keyboard is used to play the scale notes with a more conventionally represented keyboard displayed on the screen. The program is set for monophonic playing but, since you have three channels available, three note polyphony is possible.

You can create your own sounds by manipulating the waveforms and envelope shapes, changing the parameters by reference to the screen. More complicated effects are possible by synchronising different oscillators.

The other major section is the music screen which lets you type in music straight from the keyboard, manipulate it and store it. The program comes with various presets in the form of sounds and rhythms. The manual is pretty good and the price is probably justified by the completeness of the system.

Brian Eastly



Spelt out

Program Alpha-Beth Price
£6.99 **Micro Spectrum**
Supplier A & F Software, Unit 8, Canal Side Industrial Estate, Woodbine Street East, Rochdale, Lancashire OL16 5LB.

Beth, a rather chunky sprite, hops around a representation of a near-standard Qwerty keyboard, controlled by user-definable keys — a plus point in an educational program.

Above her a VDU displays questions and Beth must jump on the correct keys to spell out the answer.

This can be done unaided for a bonus or help is available via a Hangman-type game option or a brief glimpse of the answer. Hindrance comes from the school bully and allies

who move randomly round the keyboard. Collisions are fatal.

The game is reasonably enjoyable although it is too easy to type a letter twice and questions begin to be repeated. Other databases of questions are apparently available. In theory, the program combines spelling practice, keyboard acquaintance and general knowledge. However I suspect that it merely encourages rote learning of facts.

Despite these reservations I would have given *Alpha-Beth* three stars, if not for the inclusion of several spelling errors in the program itself. One question even requires the answer Captin (sic) Kirk'. This is unforgivable in an educational game and I cannot recommend it.

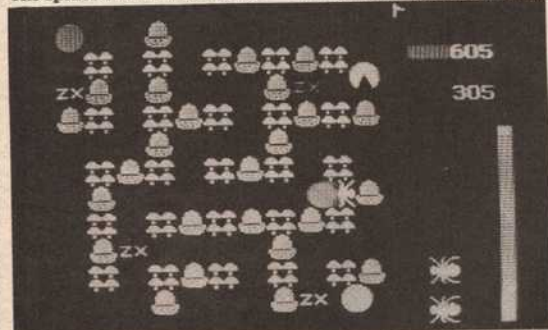
John Minson



Trapped

Program *Hyperaction Micro*
Spectrum Price £5.95 **Supplier**
Silversoft, London House, 271-
273 King Street, London W6.

Hyperaction's hero is a spider, and this alone ought to justify its release to an unsuspecting world. Unfortunately, there is little else to recommend the game. The spider is in the middle of a



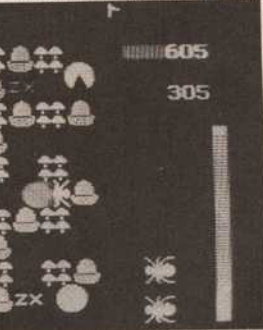
fairly small maze, and must touch some "ZX" symbols to gain points. Barring the way are a number of pacman gobblers who seem to like spider, for lunch.

The difficulty of the game is that the maze is so small that there is very little room to avoid these hungry mite-eaters, and you are easily trapped in a corner with nowhere to run. There are more screens and new dangers to face, but since I

never got near clearing the first one, even with the generous allowance of six lives, I cannot confirm that.

I suppose there must be a technique to it all, but I couldn't find it!

The graphics are large and detailed — hence the small size of the maze — and colour is used well if you have a colour monitor or TV. In black and white, though, some of the pacmen are almost invisible, adding to the game's difficulty.



There is some use of sound, though not during the action, presumably to avoid slowing things down too much.

As you would expect from Silversoft, the game is bug-free, provides for a wide range of controls, and responds well. Maybe, it could get to be addictive — if I could do it.

Simon Springett



Complex

Program *Microgo/Micro BBC/*
Electron Price £9.95 **Supplier**
Edge Computers, 3 Junction
Road, Reading, Berks.

There can't be all that many traditional games left to computerise.

Latest to fall under the spell of the microchip is Go which is, apparently, the Japanese equivalent of darts as a national game.

It's a strategic game for two players involving the placing of stones on a lattice-like board in such a way as to enclose and thereby capture territory from your opponent. Though the rules are simple, playing the game can be incredibly complex.

The computer version allows you to play against the computer, no mean achievement considering the potential complexity of the considerations involved in play. Response times are fast — no more than three seconds on the BBC on average so you don't have to hang about.

There is an excellent 'Beginners level' play option where, as you play the game, mistakes and/or vulnerable positions are pointed out to you by the computer.

It's a useful option and I found it invaluable while trying to master the game.

A well designed and excellent implementation of a fascinating game.

Brian Eastly



Slides

Program *Son of Bagger Price*
£7.95 Micro BBC B Supplier
Alligata Software Limited, 1
Orange Street, Sheffield S1
4DW

It's like watching a world immersed in clear syrup. The animation ripples along in an unsettling way which does not make it any easier to negotiate the hazards of a top secret building to escape with secret papers. *Son of Bagger* repeats the formula of using a window at the top of the screen to display

our hero while the bottom half keeps track of the score.

The game works because the sequence of slides, trapdoors, stepping stones and marauding beasts is full of novelty and challenge.

Your task is to pick up the keys to the establishment and escape. It is seldom straightforward. Some keys are visible but behind walls that mean a major detour to pass. Others are obtainable but then you're trapped. Even skilled games-players should find several hours of fun here.

Dave Watterson



Kamakazi

Program *Suicide Express*
Price £9.99 **Micro Commodore**
64 Supplier Gremlin Graphics, Alpha House, 10 Carver
Street, Sheffield

Try twiddling your thumbs in opposite directions. Tricky isn't it?

Now imagine doing this walking on a tightrope suspended between two double decker buses motoring down the M1 at 60 mph, while reciting Shakespeare and ducking to avoid the enemy gunfire. You are now experiencing a sensation not unlike playing *Suicide Express*.

The format of the game is similar to *Loco* — with a scrolling plan-view of the network of tracks in the lower section of the screen (together with your score, status and so on), and a side view of the action above.

The graphics are superb in detail, colour and perspective,

but you are unlikely to have time to appreciate this, as your mind is usually on other things.

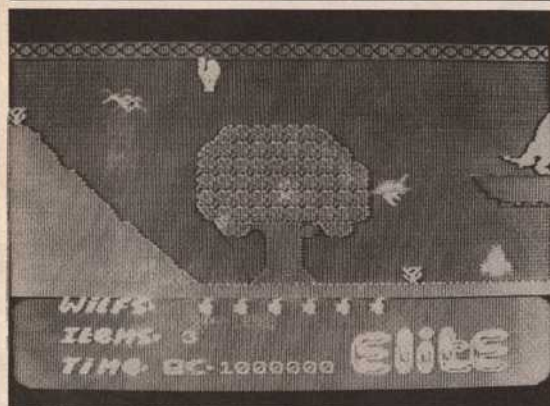
The idea is to control a futuristic train equipped with missiles, fired in front or up and behind. Travelling along the network — choosing when to switch tracks — the least of your problems are avoiding oncoming traffic and replenishing your ammunition supply (too many on board and you blow up).

Other diversions include purple kamakazi hovercraft, green delta-winged bombers, and for good measure the odd flying saucer ... all programmed to prematurely end your journey.

You are given three chances to get as far as you can.

To hell with the details ... this game has got me hooked, from the loading screen and music to the machine-code synthesised voice announcing 'Game Over'. **Joanna Gordon**





Control

Program Kokotoni Wilf Price £5.95 Micro Spectrum Supplier Elite Systems, 55 Bradford Street, Walsall WS1 3QD.

Kokotoni Wilf — sorry, Wilf — is an arcade adventure in the style of the *Jew Set Miner's* but this quest is for pieces of an amulet scattered through time.

Starting One Million BC Wilf must dodge dinosaurs, avoid adders and give sharks the slip to gather all 12 pieces before he can retrace his steps through the screens to a time gate to the next era.

It calls for perfect timing and a steady hand to make Wilf, who has wings, walk or fly but there is a choice of keys which

are so responsive that, with practice, he can be made to hover in mid-air.

The screens are beautifully drawn and animated and there is a real incentive to continue. There are several witty touches, such as two cavemen playing with a wheel, and many ingeniously timed traps.

If I have a complaint it is that when your sixth Wilf is killed you go back to the very start however far you had advanced.

The game is well structured though, beginning easy and becoming extremely difficult. *Kokotoni Wilf* calls for control, cool and strategy. It is FUN! Supporters of the 'Miner' won't be disappointed.

John Minson



Strategy

Program American Football Price £9.99 Micro Spectrum



Supplier Argus Press Software Group.

To those who think American football is just two rows of bodybuilders

Nightmare

Program Nightmare Maze Price £6.95 Micro BBC B Supplier MRM Software, 17 Cross Coates Road, Grimsby, DN34 4QH

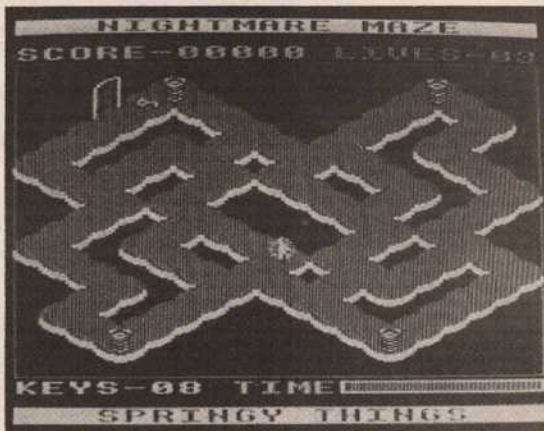
There is a horror built in to *Nightmare Maze* by Mike Williams: you can't move where you want! Just as in a dream you know where to go but can't make your feet obey, so in this game you have to be in exactly the right spot to cross the maze's paths. If you press two direction keys at once the micro always reads the wrong one first.

It would be easy if you were not being chased by speedy

beasties who don't suffer the same problems themselves. What's worse is you can't simply keep out of their way for you have to catch a certain number of keys (eight on the first level) in order to unlock the door and escape. If you can reach a cup of black coffee the monsters vanish for a few blissful moments and you get a couple of keys. Then they're back and angrier than ever. When you do escape, the nightmare continues with more of the same...

The maze is one of the diagonal type becoming popular as poor-man's 3-D effect and the game is infuriatingly addictive.

Dave Watterson



bludgeoning each other, a computer simulation may seem futile. Far better to hurl yourself against a brick wall.

But addicts of Channel Four's broadcasts know that the ol' Gridiron is a matter of strategy; metaphorical warfare, with each team fighting to win ground. Argus therefore dub this a 'Mind Game'.

The display is a plan of the field, populated by tiny, well animated players. Details of 'Yards to Go', 'Downs', 'Time Left' and the position of the ball appear below it. Play, against either computer or human, consists of entering a two-letter code for your tactics, chosen from eleven offensive and four defensive plays, plus 'Time Outs', with a flashing character indicating the ball carrier. After entering the tactics you then

watch the little men hurling themselves into one another.

The program includes an invaluable booklet which elucidates the game's mysteries before explaining the program.

Like many micro simulations it is difficult to capture the 'pazzazz' which characterises the real thing (no microchip cheerleaders?) but I enjoyed it. Playing against the computer the game tends to degenerate into a variation on 'stone paper scissors', but played by a league of friends it could become a cult.

The program is a bit pricey, though.

John Minson



Travel with...



Now Trashman is a great British success he's ready for international stardom – and you can help him on his way around the world. Our hero has the tall order task of cleaning up every major litter spot around the globe. Scooping up flowers thrown into the bull ring by matador fans in Spain, collecting the tissues of the faithful as they sob by Jerusalem's Wailing Wall, picking up coconuts from a palm beach in Samoa and collecting the empties at the German beer festival (Trashman still likes his tippie!) are just some of the challenges that make up Trashman's task.

Of course, your skill can help our hilarious hero to complete the necessary litter collection at every location, so he can earn the money to fly on to the next country in his round the world quest. And as he visits every continent on Earth in search of rubbish you can share every fun filled, thrill packed second with him.

Travel with Trashman has one or two player scoring, Hall of Fame and is compatible with Kempston, Sinclair Interface 2, Protek or equivalent joysticks. Available for the 48K Spectrum today from most good computer stores for just £5.95.

TRAVEL WITH TRASHMAN. AUTHOR – MALCOLM EVANS

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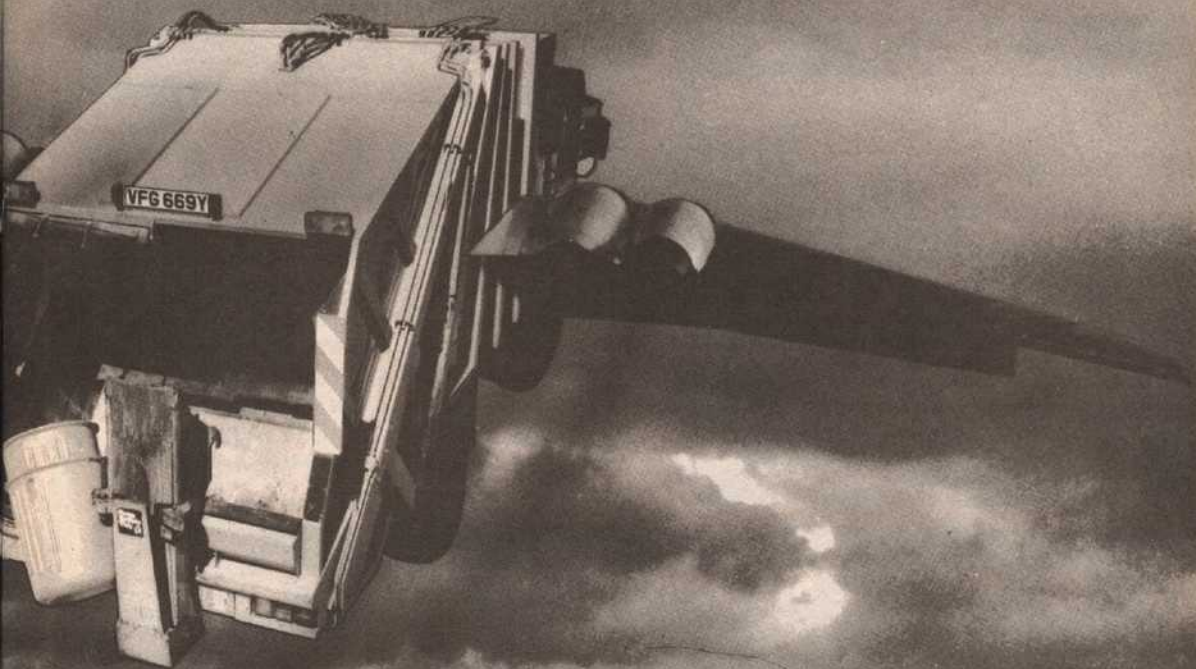
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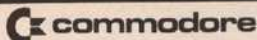


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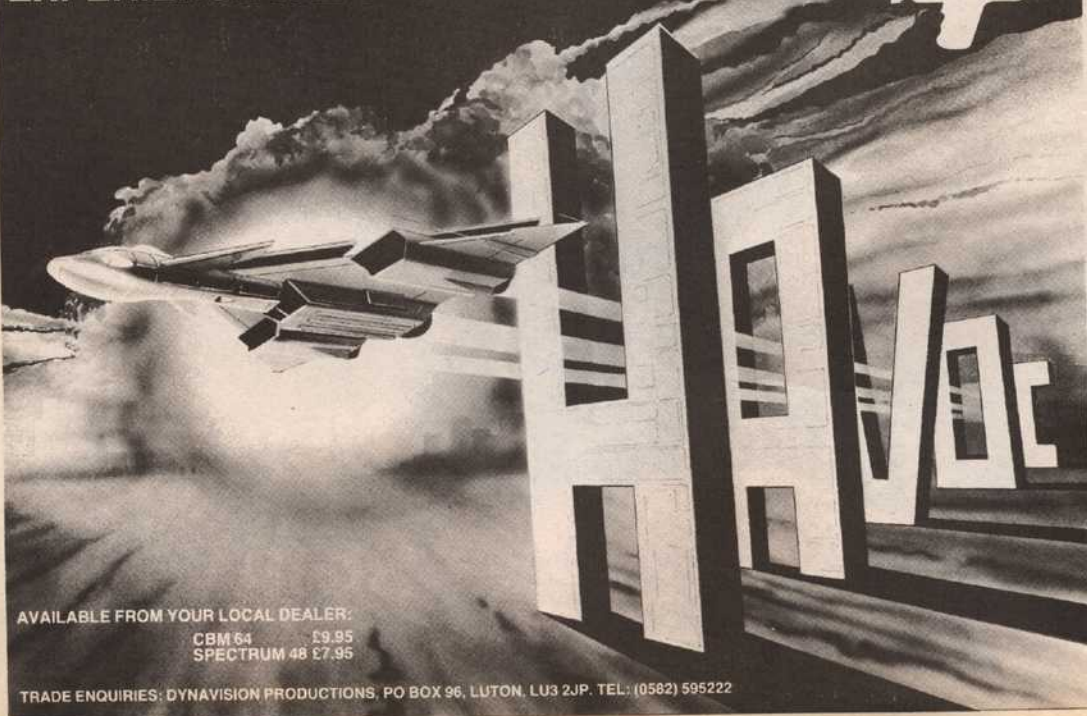
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On loading and running the program, a message is displayed. This informs the user that, during editing, pressing *Edit* and then

entering *Help* will show all the facilities of the editor.

Pressing any key will then clear the screen and print the editing cursor in the top left corner. Text may now be entered from the keyboard.

The editing facilities are, briefly, as follows:

1. To move the cursor around the screen, use *Caps Shift* and any of the arrow keys.
2. To delete a character and close up the text, type *Symbol Shift* and *=*.
3. To insert a space, type *Symbol Shift* and *<*.
4. To invoke the command procedure (see

below) type *Caps Shift* and *Edit*.

These are the only single key functions. There are additional commands available. These are entered by first pressing *Edit* and then, in response to the prompt *Command?*, typing one of the following words:

Print Print the file on the ZX printer.
(Press any key to stop.)
Clear Clear the text file and start again.
Load Load a text file from tape.
Save Save a file on tape.
Find Find a specified word in the file, and display from it.
Help Display all editing commands/functions.

Other points to note are:

When typing or moving the cursor around the screen, the displayed text will scroll in the appropriate direction when necessary.

Commands may be typed in upper or lower case. All keys auto repeat.

```

1 REM
15 REM *****
16 REM *
20 REM * SPECTRUM *
22 REM * SCREEN EDITOR/ *
24 REM * WORD PROCESSOR *
26 REM *
28 REM * @ R.A.JONES *
30 REM *
32 REM * 28th NOV 1983 *
34 REM *
40 REM *
42 REM *****
44 REM * Issue 1.0 28/11/83 *
46 REM *****
48 REM
50 REM
80 LET size=3200
97
98 REM INITIALISATION
99
100 DIM f$(size)
110 LET start=1
120 CLS : PRINT AT 5,0:"*****"
130 PRINT AT 10,0:"PRESS 'EDIT'
140 AND THEN TYPE 'HELP' FOR
150 INSTRUCTIONS". PRINT AT 15,0:"
160 Press any key to start": PAUSE
170 CLS
180 LET x=0: LET y=0
190 PRINT f$(start TO start+703)
200
210 GO SUB 5000: REM print curs
220
230 REM MAIN LOOP
240
250 GO SUB 500: REM * get char
260
270 IF a$=CHR$ 7 THEN GO SUB 40
280 GO TO 160: REM * command
290
300 IF a$=" " AND a$=CHR$ 127
310 THEN GO SUB 2000: GO TO 160: RE
320 M * Print character
330
340 IF a$=0 AND a$=11 THEN GO 3
350 US 3000: REM * cursor key
360
370 IF a$=199 OR a$=200 THEN GO 5
380 US 5500
390 GO TO 160
400
410 REM *****
420 REM *****
430 REM *****
440 REM *****
450 REM *****
460 REM *****
470 REM *****
480 REM *****
490 REM *****
500 REM *****
510 REM *****
520 REM *****
530 REM *****
540 REM *****
550 REM *****
560 REM *****
570 REM *****
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810 REM *****
820 REM *****
830 REM *****
840 REM *****
850 REM *****
860 REM *****
870 REM *****
880 REM *****
890 REM *****
900 REM *****
910 REM *****
920 REM *****
930 REM *****
940 REM *****
950 REM *****
960 REM *****
970 REM *****
980 REM *****
990 REM *****

```

```

1295 REM PRINT FILE
1296
1297
1300 PRINT #0; AT 0,0: FLASH 1;"P
1310 any key to abort": IF INKEY
1320 $="" THEN GO TO 1300
1330 FOR i=1 TO size STEP 32
1340 LPRINT f$(i TO i+31);
1350 REM include this line if
1360 double line spacing is required
1370 LPRINT CHR$ 13
1380 IF INKEY$="" THEN GO TO 13
1390
1400 NEXT i
1410 PRINT #0; AT 0,0:"
1420 RETURN
1430
1440 REM PRINT COMMANDS
1450
1460 LET f$(start+(y+32))=a$
1470 PRINT AT y,x;f$
1480 GO SUB 2500: REM * inc x
1490 PRINT AT y,x: PAPER 4;SCREE
1500 N$(y,x)
1510 RETURN
1520
1530 REM INCREMENT Y
1540
1550 PRINT AT y,x;SCREEN$(y,x):
1560 REM * print over cursor
1570 LET x=x+1
1580 IF x>32 THEN LET x=0: GO 5
1590 US 2600: REM * inc y
1600 GO SUB 5000: REM print cursor
1610 RETURN
1620
1630 REM INCREMENT X
1640
1650 PRINT AT y,x;SCREEN$(y,x):
1660 REM * print over cursor
1670 LET y=y+1
1680 IF y>21 THEN GO TO 2650
1690 LET y=21
1700 LET start=start+32
1710 IF start>size-704 THEN LET
1720 start=size-704
1730 CLS : PRINT f$(start TO sta
1740 rt+703)
1750 GO SUB 5000: REM print curs
1760 RETURN
1770
1780 REM DECREMENT Y
1790
1800 PRINT AT y,x;SCREEN$(y,x)
1810 LET x=x-1
1820 IF x<0 THEN LET x=31: GO SU
1830 B 2600: REM dec y
1840 GO TO 5000: REM print curso
1850 RETURN
1860
1870 REM DECREMENT X
1880
1890 PRINT AT y,x;SCREEN$(y,x)
1900 LET y=y-1
1910 IF y<0 THEN GO TO 2850
1920 LET y=0: LET start=start-32
1930 IF start<1 THEN LET start=1
1940 CLS : PRINT f$(start TO sta
1950 rt+703)
1960 GO SUB 5000: REM print curs
1970 RETURN
1980
1990 REM MOVE CURSOR
2000
2010 IF a$=8 THEN GO SUB 2700: RE
2020 TURN
2030 IF a$=9 THEN GO SUB 2500: RE
2040 TURN
2050 IF a$=10 THEN GO SUB 2600: R
2060 TURN

```

Continued on page 30


```

RETURN
3030 IF a=11 THEN GO SUB 2800: R
RETURN
3997
3998 REM ***** COMMANDS *****
3999
4000 INPUT "Command? "; LINE a$..
4010 IF a$="PRINT" OR a$="PRINT"
THEN GO SUB 3300: RETURN
4020 IF a$="CLEAR" OR a$="CLEAR"
THEN RUN
4030 IF a$="FIND" OR a$="FIND" T
HEN GO SUB 1200: RETURN
4040 IF a$="LOAD" OR a$="LOAD" T
HEN INPUT "File name? ";a$: LOAD
a$ DATA f$: RETURN
4050 IF a$="SAVE" OR a$="SAVE" T
HEN INPUT "File name? ";a$: SAVE
a$ DATA f$: RETURN
4060 IF a$="HELP" OR a$="help" T
HEN GO SUB 5600
4490 RETURN
4997
4998 REM ***** EDITOR *****
4999
5000 PRINT AT y,x; PAPER 4;SCREE
N$ (y,x): RETURN
5497 REM ***** EDIT *****
5498
5500 IF a=200 THEN LET f$(start+
x+(y-32)+1 TO size)=f$(start+x+(
y-32) TO size); LET f$(start+x+(
y-32))=" " GO TO 5520
5510 IF a=199 THEN LET f$(start+
x+(y-32)-1 TO size)=f$(start+x+(
y-32) TO size)+" " GO SUB 2700:
GO TO 5520
5520 CLS: PRINT f$(start TO sta
rt+700)
5530 GO SUB 5000: REM print curs
or
5540 RETURN
5597 REM ***** PAGE *****
5598
5599 REM *****
5600 CLS
5610 PRINT " ***** EDITOR FUNCTIONS *****"
5620
5630 PRINT " KEY FUNCTION"
5640 PRINT " "
5645 PRINT " <= DELETE CHR
5650 PRINT " BEHIND CUR
5655 PRINT " RACTER

```

```

SOR AND MOVE TEXT UP 1
SPACE"
5660 PRINT ">= INSERT A E
5670 PRINT " LANK AT THE CURSOR POS
ITION"
5680 PRINT " ARROW MOVE THE C
5690 PRINT " URSOR IN KEYS DIRECTION
OF THE ARROW"
5700 PRINT " EDIT INPUT COMM
5710 PRINT " AND"
5720 PRINT " PRINT: PRINT
5730 PRINT " Press any key to co
ntinue"
5740 PAUSE 0
5750 CLS
5760 PRINT " ***** EDITOR COMMANDS *****"
5770
5780 PRINT " COMMAND ACTION"
5790 PRINT " "
5800 PRINT " PRINT PRINT THE
5810 PRINT " FILE"
5820 PRINT " CLEAR CLEAR THE
5830 PRINT " WHOLE FILE"
5840 PRINT " LOAD LOAD A FIL
5850 PRINT " E FROM TAPE"
5860 PRINT " SAVE SAVE A FIL
5870 PRINT " ON TAPE"
5880 PRINT " FIND FIND A STR
5890 PRINT " ING (WORD) AND DISPLA
Y FROM THERE"
5900 PRINT " PRINT
5910 PRINT " These commands shou
ld be entered after press
ing EDIT"
5920 PRINT " Press any key to co
ntinue"
5930 PRINT " PAUSE 0
5940 CLS: PRINT f$(start TO sta
rt+700)
5950 GO SUB 5000
5960 RETURN
5997
5998 REM ***** END OF CODE *****
5999
6000 STOP
6005 SAVE "sp": STOP

```



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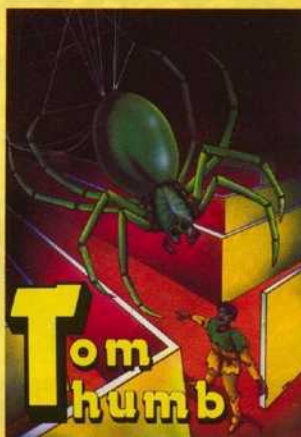


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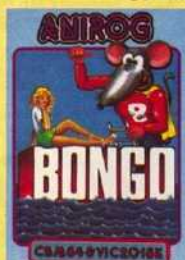
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A global option

This useful utility by **Martin Amess** provides a string search facility

One useful feature that is sadly missing from the QL is the facility to search for and/or replace a certain string contained in a program.

The following program implements this feature allowing you to search for and replace a chosen string contained in a selected program stored on a microdrive. There are three options to choose from.

The first is a search only option. The second goes one stage further and allows you to replace your selected string if required. The third is a global replace option which will replace all occurrences of the selected string.

When either option 2 or 3 is chosen then a new program with the alterations will be stored in the file *File.Bak*. At the beginning, any existing file with the name *File.Bak* will be deleted. When the search is completed you can copy the file *File.Bak* to your own program name if you are satisfied with it using the *Copy* command.

Program Notes

Lines 115 to 225

This repeat loop contains the main menu. You are requested to enter your chosen option number (1 to 3). Any other number will result in the program ending.

You will then be asked to enter the string that is to be searched for. If you selected options 2 or 3 you will then be asked to enter the new string that will replace it.

Finally you will need to enter the file that is to be searched, in the format *Mdv?Name.of.File*, where ? is the Microdrive number and *Name.of.File* is the name of the file stored on microdrive.

Lines 230 to 310

The procedure *Search* is defined. This procedure will search line by line for any occurrence of your selected string. When a line is found it will be displayed on the screen and the prompt *Any More (Y/N)?* displayed. Answer Y to continue the search or N to return to the menu.

Lines 315 to 475

The procedure *Search.Replace* is defined. This procedure is similar to *Search* except that when a line is found containing the selected string you will be asked *Replace? (Y/N)* after the line has been displayed on the screen. Answering Y will replace the string in this line with that of the new data entered at the beginning.

After entering Y or N, the program line will be checked further to see if there are any more occurrences of the selected string. If there are you will be asked again whether or not to replace it.

Once the line is completed the program will continue checking the next line. When

the end of the file is reached you will be returned to the menu.

Lines 480 to 620

The procedure *Global* is defined. This procedure works in the same way as the *Search.Replace* procedure except that the user is not asked whether or not to replace individual occurrences of the selected string. All occurrences are automatically replaced. As each line is processed by the program it is displayed on the screen.

A problem with the QL is that when a line of data is inputted from a file it must not be longer than approx. 125 characters, otherwise the *Buffer full* error will be given.

Many program lines are often larger than 125 characters and therefore this program would not necessarily work with all program files. So to avoid this problem, data is inputted one character at a time using the *Inkey\$* keyword. Although this will resolve this problem, it does mean that it slows the program down.

The procedure *line.Input* (Lines 640 to 675) inputs the data from the file one character at a time, searching for the control character *Chr\$(10)* which represents the end of each particular line of data.

However, should you be sure that your program does not contain any lines over 125 characters, then lines 265,365 and 530 can be replaced by the line *Input #11, Line\$, which will enter data from the file line by line and therefore speed the program up considerably.*

```

100 REMARK SEARCH & REPLACE
105 REMARK © 1984 MARTIN AMESS
110 INK 7 : PAPER 0
115 REPEAT MENU_LOOP
120 CLS #0:CLS #1
125 REMARK MAIN MENU
130 AT 2.10:PRINT "MAIN MENU" AT 3.10:PRINT "-----"
135 AT 8.0:PRINT "Enter required option." AT 10.5:PRINT
  "1. SEARCH ONLY" AT 12.5:PRINT "2. SEARCH & REPLACE"
  AT 14.5:PRINT "3. GLOBAL REPLACE" AT 16.2:INPUT "EN
  TER NUMBER:OPTION
140 IF OPTION < 1 OR OPTION > 3 THEN EXIT MENU_LOOP
145 CLS
150 IF OPTION <> 1 THEN DELETE MDV1.FILE.BAK
155 AT 10.5:PRINT "ENTER STRING TO SEARCH FOR:"
  AT 12.7:INPUT SEARCH_STRING$
160 IF OPTION= 2 OR OPTION= 3 THEN
165 AT 12.5:INPUT "ENTER NEW STRING:NEW_STRING$
170 OLD_LEN=LEN(SEARCH_STRING$):NEW_LEN=LEN
  (NEW_STRING$)
175 END IF
180 IF SEARCH_STRING$="" THEN STOP
185 CLS AT 10.1:PRINT "ENTER FILE NAME TO SEARCH:" AT
  11.5:PRINT "E.G. 'MDV1.TEST
  .BAS'" AT 13.0:INPUT FILE_NAME$
190 CLS
195 Select ON OPTION
200 =1 : SEARCH
205 =2 : SEARCH_REPLACE
210 =3 : GLOBAL
215 END Select
220 END REPEAT MENU_LOOP
225 STOP
230 REMARK SEARCH FOR A STRING
235 Define PROCEDURE SEARCH

```

```

240 AT 0.10:PRINT "SEARCH ONLY" AT 1.10:
  PRINT "-----";
245 OPEN #10:FILE_NAME$
250 REPEAT SEARCH_LOOP
255 AT 10.10:PRINT "Searching..."
260 IF EOF(#10) THEN EXIT SEARCH_LOOP
265 LINE_INPUT
270 SET=SEARCH_STRING$ INSTR LINE$
275 IF SET THEN
280 SCR_CLEAR AT 10.0:PRINT LINE$
285 AT 16.0:INPUT "ANY MORE (Y/N)?" QUES$
290 IF QUES$="N" THEN EXIT SEARCH_LOOP
295 SCR_CLEAR
300 END IF
305 END REPEAT SEARCH_LOOP
310 CLOSE #10:END Define
315 REMARK SEARCH AND REPLACE A GIVEN STRING
320 Define PROCEDURE SEARCH_REPLACE
  PRINT "-----"
325 AT 0.10:PRINT "SEARCH & REPLACE" AT 1.10
330 OPEN #10:FILE_NAME$
335 OPEN_NEW #11:MDV1.FILE.BAK
340 SCR_CLEAR
345 REPEAT LOOP
350 AT 10.10:PRINT "Searching..."
355 IF EOF(#10) THEN EXIT LOOP
360 SET=0
365 LINE_INPUT
370 SET=SEARCH_STRING$ INSTR LINE$
375 IF SET THEN LINE_FOUND
380 PRINT #11:LINE$
385 END REPEAT LOOP
390 CLOSE #10 : CLOSE #11
395 END Define SEARCH_REPLACE
400 Define PROCEDURE LINE_FOUND

```



```

405 SCR_CLEAR
410 AT 10.0 PRINT LINE#
415 AT 15.0 INPUT "REPLACE ? (Y/N) " : OUS#
420 SCR_CLEAR
425 IF OUS# <> "Y" THEN RETURN
430 NEW_LINE# = FILL$( " " , ((LEN LINE#) +
  (NEW_LEN - OLD_LEN)))
435 NEW_LINE#(1 TO (SET-1)) = LINE#(1 TO (SET-1))
440 NEW_LINE#(SET TO) = NEW_STRING#
445 IF (SET + NEW_LEN) > LEN LINE# THEN GO TO 235
450 NEW_LINE#((SET + NEW_LEN) TO) = LINE#(
  SET - OLD_LEN TO)
455 LINE# = NEW_LINE#
460 SET1 = SET + SEARCH_STRING# INSTR LINE#
  ((SET + NEW_LEN) TO)
465 IF SET <> 0 THEN SET = SET + SET1 - OLD_LEN
470 IF SET THEN GO TO 235
475 END DEFINE
480 REMARK GLOBAL SEARCH & REPLACE
485 AT 3.0 DEFINE PROCEDURE GLOBAL
490 AT 0.10 PRINT "GLOBAL REPLACE" AT 1.10
  PRINT "-----"
495 AT 3.2 PRINT "Processing line#"
500 OPEN #10, FILE_NAME#
505 OPEN_NEW #11, MDV1_FILE_BAK
510 SCR_CLEAR
515 REPEAT GLOBAL_LOOP
520 IF EOF(#10) THEN EXIT GLOBAL_LOOP
525 SET = 0
530 LINE_INPUT
535 SET = SEARCH_STRING# INSTR LINE#
540 IF SET THEN AMEND_LINE

```

```

545 PRINT #11, LINE#
550 SCR_CLEAR AT 10.0 PRINT LINE#
555 END REPEAT GLOBAL_LOOP
560 CLOSE #11 : CLOSE #10
565 END DEFINE
570 DEFINE PROCEDURE AMEND_LINE
575 NEW_LINE# = FILL$( " " , ((LEN LINE#) +
  (NEW_LEN - OLD_LEN)))
580 NEW_LINE#(1 TO (SET-1)) = LINE#(1 TO (SET-1))
585 NEW_LINE#(SET TO) = NEW_STRING#
590 IF (SET + NEW_LEN) > LEN LINE# THEN GO TO 235
595 NEW_LINE#((SET + NEW_LEN) TO) = LINE#
  ((SET - OLD_LEN) TO)
600 LINE# = NEW_LINE#
605 SET1 = SET + SEARCH_STRING# INSTR LINE#
  ((SET + NEW_LEN) TO)
610 IF SET <> 0 THEN SET = SET + SET1 - OLD_LEN
615 IF SET THEN GO TO 320
620 END DEFINE
625 DEFINE PROCEDURE SCR_CLEAR
630 AT 3.0 CLS 2
635 END DEFINE SCR_CLEAR
640 DEFINE PROCEDURE LINE_INPUT
645 LINE# = " "
650 REPEAT LOAD_LOOP
655 AS = INKEY#(10)
660 IF AS = CHR$(10) THEN EXIT LOAD_LOOP
665 LINE# = LINE# & AS
670 END REPEAT LOAD_LOOP
675 END DEFINE LINE_INPUT

```

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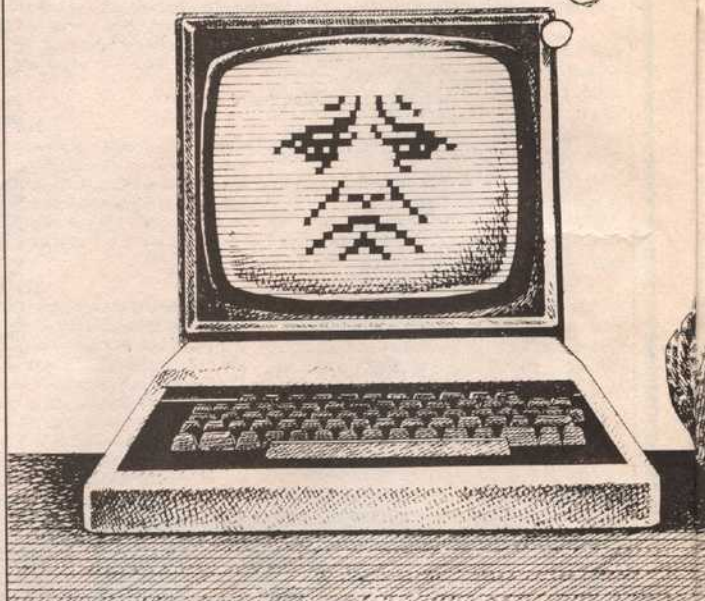
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A sign of the times

Reduce your multiplication error on the CBM 64 with this utility program by **Steve McCarthy**

The following routine for long multiplication will allow numbers of any length to be multiplied together and an answer produced which omits both rounding and any 'E' format. Further to this, it has been discovered that the function on the CBM 64 sometimes results in inaccurate results and again is limited by the length of a number which may be handled.

The 'raising a number to a power' inaccuracies may be overcome using the formula $\text{Print Int}((AN)+.5)$, but there is still the limitation of the numbers' lengths. The subroutine below overcomes this.

Program 1 is an example program merely to pass values over to the subroutines. As it stands, the length of numbers is limited by the length of line accepted by the Input command, but if the subroutines are incorporated in another program, the size of number is limited only by the space available to the relevant strings within the Commodore's memory.

Program One

The two numbers to be multiplied are passed to the subroutine in **A\$** and **B\$**. **WN** denotes whether these are both whole numbers or not.

The answer is returned in **Z\$**.

N, **I** and **J** are control loop variables.

Temporary variables are **E**, **N1**, **N2**, **A**, **B**, **C**, **X\$**, **Y\$** and **ES**.

Neg is a signal which flags whether the result will be negative (1) or positive (0).

Nd is a value denoting the number of decimal places in the answer.

Program 2

In addition to the above, **Po** holds the power the number is to be raised to.

P is a control loop variable.

P\$ is a temporary variable.

Input rules

For long multiplication, either integers or decimals, positive or negative, may be input. The same applies to the number to be raised to a power. However, the power can only be positive.

Line No.

- 10-180 Example program to collect and pass on input values
- 1000 Check to see if either input value is 0. If it is, return 0 in answer.
- 1005 Zeroise variables and check if both numbers are integers.
- 1010-1095 Find decimal point(s), adjust strings and signal a decimal answer.
- 1100-1106 Check for negative value of input and signal if found.
- 1108-1240 Multiplication routine.
- 1250-1270 Remove leading zeroes from answer.
- 1290 Adjust format of answer if not whole number.
- 1300 Add leading zero to answer if it is a decimal less than 1.
- 1310-1320 Add negative sign to answer if flagged and return.
- 2000-2020 Subroutine for handling powers.

```

5 REM*****PROGRAM 1.....EXAMPLE INPUT*****
10 PRINT"PRESS 1 FOR POWER, 2 FOR LONG MULTIPLICATION."
20 GETK$:IFK$="2"THEN100
30 IFK$="1"THEN20
40 PRINT"ENTER NUMBER TO BE RAISED:"INPUTP$
50 PRINT"ENTER POWER:"INPUTPO
60 PRINT"INPUT 1 IF NUMBER IS AN INTEGER, ELSE 0:"INPUTWN
70 IFWN<1ANDWN<0THEN60
80 GOSUB2000:GOTO150
100 PRINT"ENTER FIRST NUMBER:"INPUTA$
110 PRINT"ENTER SECOND NUMBER:"INPUTB$
120 PRINT"INPUT 1 IF BOTH ARE WHOLE NOS., ELSE 0:"INPUTWN
130 IFWN<1ANDWN<0THEN120
140 GOSUB1000
150 PRINT"ANSWER = ":PRINTZ$
160 PRINT"PRESS ANY KEY FOR NEXT NUMBERS"
170 GETK$:IFK$=""THEN170
180 GOTO10
999 REM*****PROGRAM 2.....LONG MULTIPLICATION
SUBROUTINE*****
1000 IFA$="0"ORB$="0"THENZ$="0":RETURN
1005 E=0:Z$="":ND=0:IFWN=1THEN1100
1010 FORN=1TOLEN(A$)
1020 IFMID$(A$,N,1)=". "THEN1040
1030 NEXTN:GOTO1060
1040 ND=LEN(A$)-N
1050 A$=LEFT$(A$,N-1)+RIGHT$(A$,LEN(A$)-N)
1060 FORN=1TOLEN(B$)
1070 IFMID$(B$,N,1)=". "THEN1090
1080 NEXTN:GOTO1100
1090 ND=ND+LEN(B$)-N
1095 B$=LEFT$(B$,N-1)+RIGHT$(B$,LEN(B$)-N)
1100 NEG=0:N1=0:N2=0
1102 ILEFT$(A$,1)="-"THENN1=1:A$=RIGHT$(A$,LEN(A$)-1)
1105 ILEFT$(B$,1)="-"THENN2=1:B$=RIGHT$(B$,LEN(B$)-1)
1106 IF(N1=1)AND(N2<1)>OR(N2=1)AND(N1<1)>THENNEG=1
1108 A=LEN(A$):B=LEN(B$)
1110 IFAT0(1-B)STEP-1
1120 FORJ=BT01STEP-1
1130 C=I+B-J
1140 IF C>A THEN1200
1150 IF C<1 THEN1190
1160 X$=MID$(A$,C,1)
1170 Y$=MID$(B$,J,1)
1180 E=E+VAL(X$)*VAL(Y$)
1190 NEXTJ
1200 E$=STR$(E)
1210 Z$=RIGHT$(E$,1)+Z$
1220 IFLEN(E$)<2 THEN E=0:GOTO1240
1230 E=VAL(LEFT$(E$,LEN(E$)-1))
1240 NEXTI
1250 ILEFT$(Z$,1)<"0"ORLEN(Z$)<ND THEN1280
1260 Z$=RIGHT$(Z$,LEN(Z$)-1)
1270 GOTO1250
1280 IF ND=0 THEN1310
1290 Z$=LEFT$(Z$,LEN(Z$)-ND)+". "+RIGHT$(Z$,ND)
1300 ILEFT$(Z$,1)="-" THENZ$="0"+Z$
1310 IFNEG=1THENZ$="-"+Z$
1320 RETURN
999 REM*****RAISING TO A POWER CONTROL
SUBROUTINE*****
2000 Z$=P$
2010 FORP=1TOPO-1
2020 B$=Z$:A$=P$:GOSUB1000:NEXTP:RETURN
    
```


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Improve your sounds on the Dragon using this machine code routine by Brian Cadge

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The interference is caused by the Dragon's IRQ program (the program that interrupts Basic 80 times a second to update the value of timer etc), so turning it off whilst producing sound eliminates this. Normal notes are produced by a square wave sound, that is turning the speaker on and off at regular intervals. To produce white noise we simply produce a random wave—taking values from the Rom at high speed will produce this effect. This is especially useful for producing gunshot and explosion type effects.

The program listed here allows you to define your own sound effects and produce them with a single command. Once installed the machine code program can be used in your own programs.

To input the program, type in the Basic loader program, taking care with the Data statements. When run, the program will either tell you that you have made an error entering the data statements (in which case you should check through the listing and correct the mistakes) or inform you that the program has loaded into reserved Ram

successfully. An Assembler listing is also included.

Sounds are defined in strings, such as *AS*, to produce the sound anywhere in your program you add the line: *XX=USR0(VARPTR(AS))*. The string does not have to be *AS*, it can be any string variable, but it cannot be a constant (eg, *USR0(VARPTR("ABC"))*).

The commands used in the string allow you to do the following:

- V— Sets initial volume (0-255)
- v— Sets rate of change of volume (-128 to +128)
- A— Sets initial Frequency (0-5000)
- a— Sets rate of change of frequency (-128 to +128)
- C— Sets number of cycles to output (0-65535)
- L— Sets lowest frequency value (100-5000)
- W— Sets square wave/white noise flag.

You do not have to set up every parameter in each string, as if a parameter is not changed, the last value used will be assumed. The string is composed as follows. Capital V indicates a volume setting, whilst an inverse V (shown above as v) indicates a rate of change of volume value. These are followed by a character whose ASCII code is the required setting, so to set the initial volume to 150, you would use *"V"+CHR\$(150)*. The rate of change of volume can be either positive so the ASCII

value following the inverse V would be 0 to 128, or negative, in which case the ASCII code is 256 minus value. So a value of minus three would give 253. To set the initial frequency, a capital A is followed by two characters whose 16 bit value is the initial setting. So to set this to 520, you would use *"A"+CHR\$(2)+CHR\$(8)*—that is $2 \times 256 + 8 = 520$. To set rate of change of frequency use an inverse A followed by the value, as used for volume.

The number of cycles to be output is set by a capital C followed by two characters as for the frequency. The higher this number is the longer the sound will last. The sound type is set by using W followed by either *CHR\$(0)* for normal noise or *CHR\$(1)* for white noise. When the frequency is changing, if it hits zero or the lowest allowed value (ie, the highest number allowed) the sound will 'bounce' and alter direction. You can set this highest value with the L command, again followed by two characters.

All this may sound complicated, but it is really very simple once you start experimenting. If the string you enter is invalid in any way, a new error message ?SD ERROR is produced. A couple of examples to try out are:

```
AS= "V"+CHR$(255)+"v"+CHR$(1)+"A"+
CHR$(0)+CHR$(200)+"a"+CHR$(15)
+C"+CHR$(4)+CHR$(20)+"L"+
CHR$(2)+CHR$(0)
AS= "v"+CHR$(5)+"a"+CHR$(1)
AS= "W"+CHR$(1)
```

Remember that lower case letters in the above examples should be entered on the Dragon as inverse letters, obtained using Shift-Q.

5 * BASIC LOADER PROGRAM

```
10 CLEAR200,32500
20 FOR I=0 TO 235:READ A$:V=VAL("&H"+A$):CS=CS+V:POKE 32501+I,V:NEXT I
30 IF CS<>23918 THEN PRINT"ERROR IN DATA STATEMENTS!":SOUND1,1:STOP
40 DEF USR0=32501
50 PRINT"CODE LOADED - USE XX=USR0(VARPTR(X$))"
60 A$="v"+CHR$(5)+"a"+CHR$(1)
70 XX=USR0(VARPTR(A$))
80 NEW
100 DATA BD,88,27,1F,01,E6,84,AE,02,A6,80,5A,81,41,27,1D,81,61,27,23,81,56,27,26
,81,76,27,29,81,43,27,2C,81,4C,27,39,81,57,27,2E
110 DATA C6,11,7E,83,44,10,AE,81,10,BF,7F,5F,5A,20,2E,A6,80,B7,7F,61,20,27,A6,80
,B7,7F,62,20,20,A6,80,B7,7F,63,20,19,10,AE,81
120 DATA 10,BF,7F,64,5A,20,0F,A6,80,B7,7F,68,20,08,10,AE,81,10,BF,7F,66,5A,5A,26
,A1,20,0A,00,C8,0F,FF,01,04,B0,01,F4,00
130 DATA B6,FF,23,8A,08,B7,FF,23,B6,FF,01,84,F7,B7,FF,01,B6,FF,03,84,F7,B7,FF,03
,1A,10,CE,9C,40,BE,7F,64,B6,7F,62
140 DATA 7D,7F,68,27,02,A4,C0,B7,FF,20,8D,40,7F,FF,20,8D,3B,B6,7F,63,BB,7F,62,4D
,26,05,70,7F,63,20,03,B7,7F,62
150 DATA 10,BE,7F,5F,B6,7F,61,31,A6,10,8C,00,00,22,05,70,7F,61,20,0F,10,BC,7F,66
,23,05,70,7F,61,20,04,10,BF,7F,5F
160 DATA 30,1F,26,B4,1C,EF,39,10,BE,7F,5F,31,3F,26,FC,39
```

Continued over the page

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Guess what's for dessert?

Pack up your BBC B and travel (if you dare) to Cannibal Island by Glynne Evans

This is a simple adventure game written in Basic on the BBC micro in mode 7. Although it does not have many locations the program is designed so more data can be added.

The scenario is a desert island in the tropics and the object is to find the lost treasure and return to your ship. The program understands most of the Basic commands.

North, west, south, east, up, down can all

be abbreviated to the first letter. Take, get, drop, swim, jump, dig, unlock, look are all self-explanatory.

To obtain a list of the objects being carried up to a maximum of three, type Inv. All commands must be capitals and most can be abbreviated to the first three letters.

Program Notes

10 to 100 Instructions and initialise variables

110 to 170 Main program loop calling other procedures
180 to 230 End of game
300 to 380 Defproc readin reads in object data
390 to 440 Defproc objects prints objects at location if any
450 to 750 Defproc input gets input and acts accordingly
760 to 800 Defproc sep separates string
810 to 890 Defproc take take routine
900 to 960 Defproc drop drop routine
970 to 990 Defproc inv inventory routine
1000 to 1780 Data for locations and exits in the form of description string then six pointers to other room numbers
NSWEUD

```

30 MODE7
40 PRINTCHR$(141);CHR$(132);: Cannibal Island"
40 PRINTCHR$(141);CHR$(129);: Cannibal Island"
50 PRINT "You have been shipwrecked on a desert island
while searching for treasure. By sheer coincidence this
is the very island Blackbeard left his fortune on.
The crew have mutinied and fled in fear of the
dangerous "
60 PRINT "Cannibals who inhabit the island." : PRINT "You
alone continue the search for the " fortune!"
70 GET#
80 CLS
90 ENVELOPE1,1,0,0,0,0,0,0,127,0,0,-1,126,126
100 L=1:E=0:DIM O$(9,1),C$(4,1),O(9),C(9):PROCREADIN:
PTD=0:CA=1:LKD=1:BM=0:LOC=1:FL=0:PLK=0
110 REPEAT
120 IF PTD=0 PROCDESCRIBE:PRINT "Z:PROCOBJECTS:PTD=1
130
140 PROCINPUT:PLK=PLK+1
150 IF O(2)=99 AND L=25 THEN PRINT "With amazing initiative
you lay the driftwood across the gap and jump across
just in time to see the wood go up in flames! Gripping
stuff eh?" : L=28:O(2)=98
160 IF L=2 AND O(1)=99 THEN GOTO 190
170 UNTIL E=1
180 IF O(1)<>99 PRINT "You are not with us any longer
sadly!" : PRINT "Another game?" : GET# : IF GET#="Y
THEN END ELSE RUN
190 CLS:PRINTCHR$(141);CHR$(132);: "Well done !"
200 PRINTCHR$(141);CHR$(129);: "Well done !"
210 PRINT "You have successfully completed the
adventure in " : PLK;" actions!"
220 PRINT "You are a HERO and return with your
treasure to England and live happily ever after
in a life of luxury!"
230 END
240 DEFPROC READIN
250 FOR A=1 TO B: READ O$(A,0),O$(A,1):NEXT
260 DATA "A Beautiful Treasure Chest","CHEST","a piece of
driftwood","DRIFTWOOD","a small bottle","BOTTLE","a
large green parrot","PARROT","**Golden keys**","KE YS",
"a banana","BANANA","a spade","SPADE","an aqualung",
"AQUALUNG"
270 FOR A=1 TO B: READ O(A):NEXT
280 ENDPROC
290 DATA 3,5,19,3,7B,12,17,9B
300 DEFPROC DESCRIBE
310 RESTORE (L=20)+980
320 READ Z$,N,S,W,E,U,D
330 IF Z$="J" THEN Z$="We are in jungle. There are paths going
everywhere."
340 IF Z$="M" THEN Z$="We are in a maze of rock formations
which all look the same to me!"
350 IF L=20 AND BM=1 THEN Z$="There is a pile of rubble
where the witch doctor's hut was!"
360 IF CA=0 AND L=7 THEN Z$="Long John Lagoon!
A hole goes down into the ground!" : D=23
370 IF CA=0 AND LOC=0 AND L=23 THEN Z$="We are in the
tunnel. The door is open to the north and light shines
from above." : N=24
380 ENDPROC
390 DEFPROC INPUT
400 PRINT "I can see"
410 A=0:FOR B=1 TO 9: IF O(B)=L THEN PRINT O$(B,0):A=1
420 NEXT
430 IF A=0 THEN PRINT "nothing else here."
440 ENDPROC
450 DEFPROC INPUT
460 INPUT "I: L= LEFT# (1,3)

```

```

470 IF L=21 AND L$="PUS" AND BM=0 THEN PRINT "BAAAAAANNNG!
!!!:SOUND0,1,6,20:BM=1:O(8)=20:PTD=0:ENDPROC
480 IF L$="REA" AND L=22 THEN PRINT "The message reads:
2B Feb 1901 I am dying...the natives have taken all
my possessions....getting weak...that witch doctor...
I'll show him...he took away aqualung..." : ENDPROC
490 IF L$="FIL" AND O(3)=99 AND L=21 AND FL=0 THEN FL=1:
O$(3,0)="a bottle of water":PRINT "The bottle is now
full." : ENDPROC
500 IF L$="EMF" OR L$="FOU" AND O(3)=99 THEN FL=0:O$(3,0)
="a small bottle":PRINT "The bottle is now empty."
:PROCCH:BOT:ENDPROC
510 IF L$="FIL" AND O(3)=99 AND L<21 AND FL=0 THEN
PRINT "You cannot reach the water." : ENDPROC
520 IF L$="SWI" AND L<8 THEN PRINT "You can't swim
here." : ENDPROC
530 IF L$="SWI" AND L=8 AND O(8)<99 THEN PRINT "You
start to swim but the water sucks you down and
you drown! (nasty!)" : E=1:ENDPROC
540 IF L$="SWI" AND L=8 AND O(8)=99 THEN PRINT "Whoosh!
You dive in and swim to the bottom. There you find a
**Golden Key**!" : O(5)=99:O(8)=98:PTD=0:SOUND0,1,
4,5:ENDPROC
550 IF L$="INV" THEN PROCIN:ENDPROC
560 IF L$="UNL" AND L=23 AND LOC=1 AND O(5)=99 THEN PRINT "
The door swings open revealing a tunnel north!":
LOC=0:PTD=0:ENDPROC
570 IF L$="HEL" THEN PRINT "What do you think this is,
a giveaway?" : ENDPROC
580 IF L$="KIL" THEN PRINT "Violence gets you
nowhere!" : ENDPROC
590 IF L$="JUN" AND L=3 THEN PRINT "W* out below!":
FOR J=255 TO 150 STEP -1: :J,1:NEXT:FOR
DEL=1 TO B:O(NEXT:PRINT "SPLASH!":SOUND0,1,4,5:
E=1:ENDPROC
600 IF O(7)=99 AND L$="DIG" AND L=7 AND CA=1 THEN PRINT
"You dig furiously and find a hidden cave below!":
CA=0:PTD=0:ENDPROC
610 IF L$="DIG" AND O(7)<99 THEN PRINT "You can't dig
without the spade!" : ENDPROC
620 IF L$="DIG" AND O(7)=99 AND L<4 THEN PRINT "You dig
a hole in the deck and the ship sinks in a whirlpool
of water!" : E=1:ENDPROC
630 IF L$="DIG" AND O(7)=99 AND L<7 THEN PRINT "You
can't dig here to ground too hard."
640 IF L$="NOR" OR L$="N" THEN IF N<0 THEN L=N:PTD=0:
ENDPROC
650 IF L$="SOU" OR L$="S" THEN IF S<0 THEN L=S:PTD=0:
ENDPROC
660 IF L$="WES" OR L$="W" THEN IF W<0 THEN L=W:PTD=0:
ENDPROC
670 IF L$="EAS" OR L$="E" THEN IF E<0 THEN L=E:PTD=0:
ENDPROC
680 IF LEFT$(I$,2)="UP" OR I$="U" THEN IF U<0 THEN
L=U:PTD=0:ENDPROC
690 IF L$="DOW" OR I$="D" THEN IF D<0 THEN L=D:PTD=0:
ENDPROC
700 IF I$="LOOK" THEN PROCDESCRIBE:PRINT "Z:PROCOBJECTS:
ENDPROC
710 IF L$="TAK" OR L$="GET" THEN PROCSEP:IF SP=1
PROCTAKE:ENDPROC
720 IF L$="DRO" OR L$="THR" THEN PROCSEP:IF SP=1
PROCDROP:ENDPROC
730 IF L$="NOR" OR L$="SOU" OR L$="WES" OR L$="EAS" OR L$="
DOW" OR L$="UP" OR L$="U" OR L$="N" OR L$="S" OR L$="D" OR L$="
W" OR L$="E" THEN PRINT "I can't go that way old chap!":
ENDPROC
740 PRINT "Don't understand old bean!"

```



```

750 ENDPROC
760DEFPROCSEP:SP=0
770FORA=1TOLEN(I%):IFMID$(I%,A,1)="" THENPS=A:SP=1
780 NEXT
790IFSP=0THENENDPROC
800P=RIGHT$(I%,LEN(I%)-PS):ENDPROC
810DEFPROCFAKE
820PF=0:FOR A=1TO9:IFD(A)=99THENPF=PF+1
830NEXT:IF PF>2 THEN PRINT"YOU are carrying too much."
      :NF=0:ENDPROC
840NF=0
850 FORA=1TO9:IFLEFT$(PF,4)=LEFT$(D$(A,1),4) AND D(A)=L
      THEN NF=A
860 NEXT
870 IF NF=0 THEN PRINT"that ain't here!":ENDPROC
880 PRINT"D.K.":D(NF)=99
890 ENDPROC
900DEFPROCIDROP
910 NF=0
920 FORA=1TO9:IFLEFT$(PF,4)=LEFT$(D$(A,1),4) AND
      D(A)=99 THEN NF=A
930NEXT
940 IF NF=0 THEN PRINT"I haven't got that!":ENDPROC
950 PRINT"D.K.":D(NF)=L
960ENDPROC
970DEFPROCINV:WE=0:PRINT"YOU have":FORA=1TO9:
      IF D(A)=99 THEN PRINTD(A,0):WE=1
980 NEXT:IFWE=0 THEN PRINT"nothing."
990 ENDPROC
1000DATA"WE are in the hold of the ship.It is dark and
      murky,the only light coming from the open hatch above."
1010DATA0,0,0,0,2,0
1020DATA"THIS is the deck.From here you can see
      the jungle and the beach to the east.The ship is
      aground in shallow water.The rigging looks climbable."
1030 DATA0,0,0,4,3,1
1040DATA"YOU climb the rigging with amazing agility and
      find the Crow's Nest.The view is incredible.The island
      is large and snow tipped mountains can be seen in
      the distance.There is a river to the East."
1050DATA0,0,0,0,0,2
1060DATA"Here is sandy beach with a dense jungle to the
      east and a large sailing ship is aground on the reef
      offshore.The beach continues north and south."
1070DATA6,5,2,9,0,0
1080DATA"THE beach continues but the rocks are larger.
      There is a dark worn track leading east into the
      jungle.Other paths go north and south."
1090DATA8,7,0,9,0,0
1100DATA"AH HAARR this be Hook Bay.The beach
      curves round to the north and back south"
1110DATA8,4,0,9,0,0
1120DATA"YOU smash your way through dense undergrowth and
      find the ancient cannibal ritual ground.A large totem
      pole sticks out of the centre of the clearing.
      menacingly!The earth is sandy and loose here."
1130 DATA5,0,0,0,0,0
1140DATA"Dead man creek.There is pool of brown stagnant
      water here with sheer cliffs all around.The only
      exit is south."
1150 DATA0,4,0,0,0,0
1160 DATA"J"
1170DATA10,8,11,11,0,0:REM ROOM 9
1180DATA"J"
1190DATA12,8,9,11,0,0
1200DATA"J"
1210DATA10,8,12,9,0,0
1220DATA"J"
1230DATA13,8,10,9,0,0
1240DATA"J"
1250DATA9,10,8,14,0,0:REM ROOM 13
1260DATA"THE jungle is thinning and I can see smoke rising
      above the trees to the north west is a jungle path."
1270DATA15,0,13,0,0,0

1280DATA"The trees are spread out and I can see a
      village of grass thatched mud huts west.It looks
      deserted.South is a path into the jungle."
1290DATA0,14,16,0,0,0
1300DATA"THIS is the centre of the village.East is the
      path into the jungle.There is a lit fire here with
      stones around the edge.All around are the mud huts."
1310DATA18,17,20,15,0,0
1320DATA"WE are in a one of the huts."
1330DATA16,0,0,0,0,0
1340 DATA"THIS is obviously the chiefs hut.It is large
      and has many animal skins on the walls.There is a
      draft from above."
1350DATA0,16,0,0,19,0
1360 DATA"WE are on the roof of the hut."
1370 DATA0,0,0,0,0,18
1380DATA"AAAA! OH NO! It's the witch doctors hut.The hut
      is hung with skins and animal teeth,claws and bones.
      In the corner sits the man himself.I think he is
      meditating"
1390DATA0,21,22,16,0,0
1400DATA"WE are by a swiftly flowing stream that is
      within easy reach.There is a push button here."
1410DATA20,0,0,0,0,0
1420DATA"AAA! WE are standing in the missionary's hut.
      A bamboo table is in one corner with a piece of paper
      stuck to it!"
1430DATA0,0,0,20,0,0
1440DATA"WE are in an underground tunnel.There
      is a locked door north."
1450DATA0,0,0,0,7,0
1460DATA"YOU NOW WILL ENTER THE TREASURE
      CHAMBERS WHICH ARE HEAVILY GUARDED
      There are exits in all directions."
1470DATA25,23,27,26,0,0
1480DATA"THIS is the south side of the fire pit,
      a natural volcanic fissure.The distance across is too
      far to jump.The only exit is south."
1490DATA0,24,0,0,0,0
1500DATA"WE are going along a round
      curving west-east tunnel."
1510DATA0,0,24,25,0,0
1520DATA"WE are going along a round curving
      east-west tunnel."
1530DATA0,0,25,24,0,0
1540DATA"m"
1550DATA32,35,34,29,0,0
1560DATA"m"
1570DATA37,37,28,30,0,0
1580DATA"m"
1590DATA29,29,32,36,0,0
1600DATA"m"
1610DATA28,33,38,29,0,0
1620DATA"m"
1630DATA31,0,31,35,0,0
1640DATA"m"
1650DATA0,34,24,32,0,0
1660DATA"m"
1670DATA0,0,33,35,0,0
1680DATA"m"
1690DATA33,0,31,37,0,0
1700DATA"m"
1710DATA37,0,0,0,0,0
1720DATA"An amazing purple rock grows out of the floor.
      There are exits east and west."
1730DATA0,0,28,36,0,0
1740DATA"m"
1750DATA39,32,35,30,0,0
1760DATA"HOORay HOORay! WE are in the treasure vault.
      The chest is in the corner full of valuable treasure!
      You must now make it back to the ship!"
1770DATA0,38,0,0,0,0
1780DATA0,38,0,0,0,0

```


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Open Forum

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed.

Catalogue

on BBC

This is a simple utility designed to run on the BBC with an Epson printer (It could easily be adapted for any printer.) The program is for those, like myself, who forget to keep careful notes on the contents of their many cassettes. The program allows a cassette

cover to be produced using the DS *Cat command. To exit use <Esc> and a screen dump is performed. Tape loading errors are ignored, the error message is retained to indicate the appropriate problem file. If the number of files is greater than one screen, <Esc> before scroll and continue with *Cat.

Program notes

10-50 Initialise printer

- 80-220 Main loop, input of tape number side, *Cat, prompts to quit or continue.
260-280 Error handling <esc> to quit *Cat, tape errors continue, other start again.
320-430 Screen dump outer loop gives address of 1st byte of each newline, inner loop gives offset, test to prevent printing of blank lines.

Variables

ts\$	Tape name
tn\$	Tape side
ans\$	Response
J	Address of 1st byte of newline
JJ	Byte offset
B	Ascii value of character to be printed

```
10REM
20REM      HARD COPY CASSETTE CATALOG
30REM
40REM      R BRIDGES 26-AUG-84
50REM
600N ERROR GOTO 260
70VDU2,1,27,1,64,3
80REPEAT
90MODE7:VDU12
100INPUT "INPUT TAPE NUMBER "tn$
110INPUT "INPUT TAPE SIDE "ts$
120VDU12
130PRINT "TAPE NO. "tn$;SPC(3); "SIDE "ts$
140*CAT
150PRDCscreen_dump
160VDU12
170PRINT "DO YOU WANT TO CONTINUE Y/N":ans$=GET$
180IF ans$="n" OR ans$="N" THEN END
190PRINT "CARRY ON WITH SAME SIDE Y/N":ans$=GET$
200IF ans$="y" OR ans$="Y" VDU12:GOTO140
210VDU2,1,10,3
220UNTIL FALSE
230REM
240REM      ERROR HANDLING
```

Catalogue
by R Bridges

Microradio

GW6JJN



Program transmission

Commodore users will be interested in an interface just released from Zero Electronics of Great Yarmouth.

The Com-in 64 enables the Commodore 64 to be used as a terminal for Baudot, Morse, Ascii and Slow Scan TV (SSTV) characters. It also boasts a built-in wordprocessor, RTTY, program transmission and mo-

dem facilities.

Message buffers can be stored from the screen to cassette or disc—the screen display itself is divided into a received text section and output section with a bar showing baud speed (45, 50, 75, 110 and 300 baud available) mode, current time, (a 24 hour clock is included), options selected, etc. Text can also be dumped to a printer.

The Com-in 64 costs £125.00. Further details can be got from Zero Electronics, 149 Kings-treet (Nash House), Great Yarmouth NR30 2PA.

More news comes from Cirkit, the mail-order electronics suppliers formerly known as Ambit. Its new modem is priced at just £59.95, and will be marketed by Protek.

Cirkit says that the modem,

the 1200, is four times smaller, three times faster, and a quarter of the price of its nearest rival. It has British Telecom approval for phone connection and can access Telecom Gold and Prestel.

Micro owners will be able to exchange data and programs over the telephone, and it will eventually send and receive electronic mail.

It will be compatible with any computer with an RS232 port and interface packs will be available for the BBC B Electron, Spectrum, QL, Atmos, Amstrad, and MSX. Cirkit is currently planning a number of similar micro products, so watch this space.

The launch of cheaper communications equipment will probably be a coming

trend, as it is becoming evident that people want to do more than play games with their micros.

Acorn's release of its Viewdata adaptor for the BBC at £113—a surprisingly reasonable price for Acorn—bears this out. The unit gives access to both Prestel and Telecom Gold. Still, the Cirkit 1200 will do all this at half the price...

Ray Berry GW6 JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, Microradio, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Open Forum

Tape Loader

on Oric

Many commercial programs display something on the screen whilst the program is loading. This program emulates this situation and is used as follows:

1. The screen program should be loaded into the computer.
2. Lines 2100 and 2120 should be customised the name of the main program and the author's name, respectively.
3. Save the screen program *Auto* and then stop the tape but *do not* rewind the tape.
4. Save the main program after loading it

into the computer.

The program works by printing a screen and then loading the next program on the tape, which should be unnamed.

Variables

- G1) General purpose numeric variables.
- G2)
- TS(1-6) Text strings.

"TAPE LOADING SCREEN" By Barbara Prowse 1984

```
996 REM*****
997 REM* TAPE LOADING SCREEN *
998 REM* BY BARBARA PROWSE 1984 *
999 REM*****
1000 CLS:PAPER7:INK0:PRINTCHR$(17):FORG1=1TO4:PRINT:NEXT
1020 FORG1=1TO7:READT$(G1):NEXT
1040 DIML(17):FORG1=1TO17:READL(G1):NEXT
1060 FORG2=1TO17:G1=L(G2):GOSUB1500:NEXT
1100 CLOAD"":CLS:PRINTCHR$(17):END
1500 IFG1=6THENPRINT " ";CHR$(4):CHR$(27):"D":CHR$(27):"J":GOTO1540

1520 PRINT " ";CHR$(27):"A";
1540 PRINTCHR$(27):"S":T$(G1):CHR$(27):"W";
1560 PRINT:IFG1=6THENPRINTCHR$(4)
1580 RETURN
2000 DATA"*****"
2020 DATA"*"
2040 DATA"* Software for ORIC 1 48k *"
2060 DATA"* is loading. *"
2080 DATA"* .....PLEASE WAIT..... *"
2100 DATA"* PROGRAM NAME (max 25 chars) *"
2120 DATA"* by NAME (max 22 chars) *"
2140 DATA1,2,3,2,1,2,6,2,7,2,4,2,1,2,5,2,1
```

Tape Loader
by Barbara Prowse

Arcade Avenue



Round the track

There's lots to squeeze in this week so let's get straight on with it. J Colthart of Tamworth has written in as a witness for his/her friend, one Simon Taylor, who has escaped *BugaBoo's* cave in just 29 seconds — and they have photos to prove it. They think this is pretty unbeatable — but do you know better? Meanwhile Gary O'Connor of Buckley in Clwyd has scored 47,410 on *Ant Attack*. He used the system that we mentioned a few weeks ago of jumping over boundary walls on an ant's back (remem-

bering that points are awarded for escaping as quickly as possible).

Gary Burrows of Liverpool has scored the following on some 'old but gold' Spectrum games: *Jet Pac* 126,760, *Pssst* 92,285, *Manic Miner* 250,000, *Zzoom* 265,900, *Arcadia* 32,632, on level 58 (which knocks spots off of my high score). Incidentally, Gary, thanks for the encouraging comments but you'll have to write to the editor if you want the Avenue enlarged.

But out of this range of truly memorable scores I must confess to being most impressed by the achievement of B P Jay of Ipswich who writes "as far as I know I'm the first person to have finished first on all ten circuits of Micromega's fantastic new game *Full Throttle*. In a three hour battle on the evening of Wednesday

15th August I sweated my way to first place on each circuit and managed to stay there until I thankfully passed the chequered flag. All races were run on four circuits of the track. We were also offered a tip that "all you need is a bit of patience!"

Andrew Lang of Great Billing has completed *Atic Atac*, *Jet Set Willy* (by cheating), *Sabre Wulf*, *Trans Am* and *Antics* and has also sent us the following extra lives poke for *Hunchback*, which I, at least, will find extremely useful, *Poke* 24760,285 gives you 255 lives (Spectrum version only).

A letter has come from Martyn Henderson of Aberdeen who is desperate for suggestions on how to land the plane in *TTL*. "I have had the game for about a month now and am more and more impressed by the graphics. It might seem a ridiculous problem but I've

tried landing every way I can think of but still can't manage it." Well, we did touch on this a few weeks ago but to recap briefly, you must fly from right to left over the airport using the shadow to line yourself up. As soon as you have passed the tree covered island you can use the altimeter to bring yourself down to almost ground level. Then, as you reach the runway, drop the last small bit and wait for the plane to stop.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to: Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Trun

on Spectrum

The idea is to avoid the blocks and your own

path, and see how long you can last. Use Q - up, A - down, O - left, P - right. It confirms you of your high score when each go is over.

Program notes

Lines 60-70 Sets up variables.

Lines 80-90 Sets up screen.

Lines 100-200 Moves player.

Lines 220-240 Checks if player has hit anything.

Lines 250 Adds to score.

Lines 400-440 Prints score, high score and what you crashed into.

Lines 500-570 Prints instructions.

```

10 REM .....TRUN.....
20 REM ....By Michael Kay....
50 GO SUB 500
60 LET hsc=0
70 LET sc=0: LET a=128: LET b=
2: LET s=1
80 PAPER 7: INK 0: CLS
90 FOR f=0 TO 120: PRINT INK 2
; AT RND*19,RND*31;"█": NEXT f
100 PLOT INK 2;a,b
120 LET n$=INKEY$
130 IF n$="q" THEN LET s=1
140 IF n$="a" THEN LET s=2
150 IF n$="o" THEN LET s=3
160 IF n$="p" THEN LET s=4
170 IF s=1 THEN LET b=b+2
180 IF s=2 THEN LET b=b-2
190 IF s=3 THEN LET a=a-2
200 IF s=4 THEN LET a=a+2
220 IF b=174 OR b=0 THEN GO TO
420
230 IF a=0 OR a=254 THEN GO TO
420
240 IF POINT (a,b)=1 THEN GO TO
400
250 LET sc=sc+.1
300 GO TO 100
400 FOR f=0 TO 100: NEXT f
410 CLS : PRINT AT 8,2;"You cra
shed into an obstacle": AT 9,11;"
or yourself": AT 11,9;"Your score
=";INT sc: IF INT sc>hsc THEN
LET hsc=INT sc: PRINT AT 3,9;"Ne
w high score"
415 PRINT AT 5,9;"High score =
";hsc: GO TO 450
420 FOR f=0 TO 100: NEXT f
430 CLS : PRINT AT 9,1;"You hit
the destructive barrier": AT 11,9
;"Your score =";INT sc: IF INT
sc>hsc THEN LET hsc=INT sc: PRIN
T AT 3,9;"New high score"
440 PRINT AT 5,9;"High score =
";hsc
450 PRINT AT 21,1;"Press any ke
y to start again"
460 IF INKEY$<>"" THEN GO TO 70
470 GO TO 460
500 BORDER 2: PAPER 2: INK 7: C
LS
510 PRINT AT 1,14;"TRUN"
535 PRINT AT 13,1;"Beware dont
get too close to the barriers"
540 INPUT "Do you want to play
(y/n)";j$
550 IF j$="y" THEN RETURN
560 IF j$="n" THEN STOP
570 GO TO 540

```

Trun

by Michael Kay

Baud Walk



It's a miracle

The highly flexible and popular WS2000 modem from Minor Miracles has finally received the official approval from British Telecom, months after it went on sale.

The WS2000 saga has taken some eight months to be settled and the final British Approvals Board nod only came after the company suppressed the modem's Bell 202 standard half-duplex capability.

The WS2000 has found a niche in the multi-standard mo-

dem market, retailing at just under £130, and rumours that previously sold units would have to be recalled were denounced by a company spokesman. "We are still trying to ascertain the final position but as far as we are concerned the company has met the standards set down by the BABT." The Telecommunications Act threatens users who use unapproved modems with severe penalties and, in fact, British Telecom is entitled under law to enter any premises where it suspects unapproved equipment is attached to its network—although in practice this is a rare occurrence.

The WS2000 operates at 300/300, 1200/1200, 1200/75 and has auto-dial and auto-answer capabilities. Minor Miracles are planning to operate their own dial-up database service which

will include a modern diagnostic facility.

Other developments are planned by the company, including a mode of operation which allows total software control over the hardware.

This development will allow, for example, setting up command files to auto log-on to networks like PSS which is a hazardous, if not tortuous, process at the moment.

The modem will also be able to set up to auto-dial at pre-determined times different databases and automatically retrieve pre-specified pages or data for later examination. This has a number of applications particularly with numeric databases-containing financial information, which could be retrieved and then integrated into packages like spreadsheets or databases.

Finally, a word on a completely different note. *MUD*, the Multi-user Dungeon game, will be appearing, it is hoped, on Compunet, the Commodore 64 database due for official launch this week. Attempts were made to load *MUD* on to the Compunet system during the Personal Computer World show, but apparently failed. *MUD* will be published on Compunet by Century Communications.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, Baud Walk Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 019963727.

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Tony Bridge's Adventure Corner



Post nuclear

There have been many new releases since I last looked at the new adventure pile. Many of them have been written with the aid of *The Quill*, which, as most of you will know, is Gilsoft's excellent adventure-writing utility.

Celyn Jones Software of Clwyd has released *The House* for the Spectrum 48K — as all these Quill'd adventures are. It's a tale of a dead witch's will, which she has secreted in a lonely old house. You live nearby, and so it is only natural that you go and search for it — but the last inhabitants of the house met with a rather unfortunate demise. But that won't put you off, will it?

D C Jones, the author, took some five weeks to complete the adventure, and he has produced a pretty good one. There are not many spelling or grammatical mistakes, and the colour is used well. As he admits, the action is a bit slow in the beginning, but soon hots up — there are a lot of objects, some mundane, like the old gardening gloves, and the spade, and others not so mundane, like the green farming liquid (what use is that going to be?). The first part of the adventure consists of a wander round the overgrown garden, and every so often, you come up against the locked door of the dark, foreboding house. Look behind you!

Not bad at all, and, to the person who completes it, four sentences are revealed: send these off to Celyn Jones, and you're in line for £100. Celyn Jones Software, 14-16 "Borthyn, Ruthin, Clwyd LL15 1NU, £5.50.

Alex Sharp, Brendon Kavanagh and David Shandley are the authors responsible for

the next Quill'd adventure, which is *Merlin's Quest*. It's based on the legend of Merlin and young Arthur Pendragon, and follows that legend very closely. The trio have studied many books in order to make things as authentic as possible, while ensuring that the adventure remains very playable. The objective of *Merlin's Quest* is the Golden Harp, which must, of course, be found (well, you can't have Golden Harps just left lying around, can you?) — or, according to the second title page, to discover Excalibur.

Very atmospheric (and educational) and great value at £5.00. SKS Software (alias Sharp, Kavanagh and Shandley) are currently looking for someone to market the game, and they are assured of a successful adventure — it's much, much better than many of the so-called "mega-adventures" which are flooding the market at the moment, and I thoroughly enjoyed playing it. For now, you can buy direct from SKS Software, Summerfield Farm, Nantwich Road, Broxton, Nr. Chester CH3 9JH.

Dowsoft! (please note the exclamation mark, PJ — and here's a couple more for you!) is the name under which the Dowling brothers write, again using *The Quill*. 19-year-old Ian writes the scenario, leaving Tim to bring his obvious talent to bear in converting it to the Spectrum. Their first release is *Adventure on the Planet Akma*, and puts you, the player, in a cell on the aforesaid planet. Your task is to break out (well, you've been there for two months, with nothing but a rat and a mound of old bones for company) then travel across the planet's surface and finally find the rebel force, the Letics.

I didn't spot any spelling mistakes, though there are a few errant hyphens, and the occasional odd layout, but there is a great deal of atmosphere in the long evocative location descriptions, and the adventure plays quite well. In fact, it would be an ideal introduction for the beginner — not too hard, but lots of intriguing puzzles (oh dear, and some maths problems, too) and very colourful. The scenario is particularly good, well above average, while retaining simplicity. There are plenty of chances for combat too. Dowsoft! 3 Hempland Drive, Stocton Lane, Yorks YO3 0AY, £5.00.

Now to the last Quill'd game this week (there'll be more, never fear!), *Survivor*,

from Redwhite Software. Written by Bob Purdy, it is a chilling tale of a post-nuclear nightmare. If this sounds familiar to you, the scenario is superficially similar to that of *Ground Zero*, the adventure from Artic. That was also Quill'd, though this fact is kept quiet by Artic — but what a difference! *Survivor* is a superb game from start to finish. The start is in your fallout shelter, where food supplies have run out.

Because this adventure is set in a post-nuclear landscape, it's only natural that things are not going to be normal — venturing outside, for a start, is not your average Sunday stroll. Before you leave your shelter, pick up the Geiger counter, this will come in handy in measuring the radiation left over from the Big Bang in each area. Some areas will be clean and harmless, while others have a high level, and thus will be dangerous to walk through. The program will tell you how many Rems per turn your body can take — and these are not Remarks! Up to 200 Rems is OK, while over 200, and you start to become ill.

There are a lot of objects, in fact, an embarrassment of them; you can only carry four, and there are at least six in the very first location that might well be useful — which ones to take, and which to leave behind? There is a rather simple puzzle at the very start to solve, giving you a word which may well come in handy later in the adventure, and this unusual aspect, along with the nightmarish atmosphere, replete with rabid rats, other crazed survivors jumping out from shadowy doorways to stab you, combines with the colourful location descriptions to make an adventure well worth playing, and highly recommended. It's £4.95 (p&p included) from: Redwhite Software, 23 Thornhill Street, Canton, Cardiff CF5 1RD. So, a bumper crop of Quill'd adventures this week. There'll be plenty yet to come.

Finally, I must just mention a couple of new adventure for the QL. I knew it wouldn't take long, and Talent Software, whose *West* adventure for the CBM64 I mentioned a couple of weeks ago, have released that game for the QL, along with a second, called *Zkul*. I haven't seen it yet, but I believe that it leans heavily on elvish Magick and other D&D delights, and apparently it is for experienced adventurers only. One feature that seems especially "why-did-nobody-think-of-that-before?", is a "scratchpad" on which the player can jot down notes for later implementation.

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This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further write to: Tony Bridge, Adventure Corner, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

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Basic workings

Srrdets Slain of Antwerp, Belgium writes:

Q I have recently bought a Tandy TRS80 Colour computer. I have always assumed that the Tandy and the Dragon computer were exactly the same until I tried some of your programs. I couldn't get any of your Basic programs to run at all but the machine-code ones all worked perfectly. Can you explain why this is?

A What is the same between the two machines is the Basic and the general hardware arrangement. The Rom routines however are different. This should mean that Basic programs are completely compatible whilst machine-code programs may need some adaptation. I can only think you were lucky with the machine-code programs you have tried which just happened to use areas of machine-code that were the same.

Equally you must have been unlucky with the Basic programs because they used machine-code Pokes or Peeks that were not the same as those used in the Tandy.

A classic question

Mr A Morris of Kingshurst, Birmingham writes:

Q I own a 48K Spectrum and would like to know whether there is a Poke that disables the Break key from being used.

A This is one of the classic questions asked quite regularly in this and every other technical advice column in the computer press.

Can you completely protect your programs? No, is the simple answer. Can you disable the break key? Yes, up to a point. It involves playing about with the error stack pointer and making it point to a different place from usual so that your program just keeps running without an error being recorded by the system. This is the line you should use (note though that it may not work with Interface 1 attached):
`Let p=Peek 23613 + 256*Peek23613 + 1:Let p=p-2: Poke 23613 + 1, Int (p/256): Poke 23613, p-256*Peek (23613 + 1).`

It's a bit drastic since it *News* the machine if you press Break, warn friends in advance!

Merits of each

Billy Lau of Spennymoor, Durham writes:

Q I own a BBC micro with disc drives and have been arguing with a friend who has a QL about the merits of each. Who is right on the following?

1) He claims the BBC is old-fashioned because it has masses of micro chips inside.

2) I think the QL's Basic is a mix of BBC and Spectrum Basics plus the odd extras. I believe the QL copied the idea of using functions, procedures, *If... Then... Else, Repeat... Until* from the BBC but he says these commands are standard and the BBC wasn't the first to use them.

3) He claims the QL is a much more powerful and faster computer altogether and is only beaten by the BBC's sound and keyboard. Please can you prove him wrong.

A Comparing—judging—two computers on these terms is not easy, still I'll try to have some sort of stab at your specific points.

1) It is true that the current chip layout on the BBC probably does reflect when it was designed and it wouldn't be the way it would be designed now. Micros these days are designed—like the Electron—with bigger and bigger ULA chips, to reduce the chip count on the circuit board and so reduce the manufacturing costs.

2) Your friend is right I'm afraid—procedures, etc, go back a lot further than the BBC. Although there are a number of features of BBC Basic which represented the first implementation of these commands on a home micro.

3) What do you mean by powerful? The QL has a lot more—that's for sure and the multi-tasking and window facilities are very sophisticated if you can get at them. But QL Basic is not faster than the BBC.

Speak and spell

David Richardson of Treskilling, Cornwall writes:

Q I have a BBC computer and we were going to buy a speech synthesiser but since our sister has a 'speak and spell' toy, I was wondering if we could link it up to the computer and use that instead. Could we do this and how much would it cost?

A The answer is almost certainly yes you could do it, but unless you have a good knowledge of electronics it probably wouldn't be worth the trouble you'd have to go to.

I don't know what speech chip the 'speak and spell' uses but it is quite likely to be the Texas one—it is used by most of the computer speech units. However, it is far from straightforward. You would need to remove the chip and build the appropriate circuitry to connect it to the BBC and then you'd have to write some fairly complex software.

Teaching programs

Mr B P King of Bream in Gloucestershire, writes:

Q I am considering purchasing the Acorn Electron but I am concerned about the availability of software—especially educational software as I have

children of five and ten years.

What percentage of BBC software is compatible with the Electron, particularly on the educational side?

A The Electron and the BBC are fully (well nearly) compatible in terms of Basic although the Electron runs considerably more slowly.

What this means in practice is that BBC programs written in Basic which do not especially require speed can be used happily on the Electron. Although some BBC educational programs fall into this category, most good ones, usually requiring at least some machine code, do not.

You are reliant, therefore, on software written especially for the machine. There is some good material but, unlike the BBC which has a special reputation in this area, there is no more than other micros like the Spectrum.

A strong dilemma

Steven Rigby of Watford Herts, writes:

Q Could you please help me? I am trying to decide on buying one of the following things. The first is to expand my Spectrum with, probably, a microdrive, a Stonechip keyboard and a Currah speech unit. The alternative is an Acorn Electron—keeping the Spectrum at the same time. Please help me decide.

A A strong dilemma! I can't really answer your questioning because I don't know what your reasoning is. I must say that unless you have some special reason for getting the Electron—BBC Basic at school for example—I can't really see that you need it. Spectrum software is certainly better, by and large, than Electron software and with a proper keyboard which you say you are thinking of getting, can be turned into a very useful word processor with *Tasword Two*.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek it to Phil Rogers* and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW, 12-13 Little Newport Street, London WC2R 3LD*

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WANTED: I need the ZX printer manual. Please contact Daniel Morrissey at 1A Ashcombe Road, Weston-super-Mare, Avon BS23 3DS, or phone 0934 31449 and ask for Daniel Morrissey.

MONOLITH ZX81 ECR 81 enhanced data recorder with certification tape. Automatic levels ensure trouble-free saving and loading. Perfect. Little Used. £26. - Phone Hornsington-Arden 2180. (West Midlands).

QUICKSHOT Joystick + BBC interface (Prolink), £20, SPC software incl. QS, Asteroids, QS Aquaplane, QS EAsyspeak, Gulpmans Avenger, £4

each, £18 the lot. - Tel: Nick on 0323-844781 after 4 p.m.

ZX 81 PROGRAMS Minor Forty, Frogger, etc. Also s/w £1.50-£22 or lot £30. - Tel: 01-639 8657.

48K SPECTRUM incl. DK Tronics Kboard, tape, rec. £400 s/w, mags £225 o.n.o. - Tel: 01-203 1490.

SPECTRUM 48K w tape recorder, books, mags, 25 originals etc. worth £400, yours for only £200 o.n.o. - Tel: 061-928 9877 (Brendon).

48K SPECTRUM I/F, microdrive, 6 cartridges, ZX printer over 30 games + s/w £250 o.n.o. - Tel: (evens) (0862) 81546.

SPECTRUM 48K still under gtee 20 original progs, Atari 850 I/F to swap for BBC B computer or sell for £100 each. - Tel: 0783 363579.

SPECTRUM TAPES : Around 25 tapes, all original. Games, educational, utilities and business, little used, from £1 each. Also Spectrum books, Adventure programming, Microdrive use etc. from £3. - Tel: Clacton (0255) 434329 days and evenings.

TURN YOUR 48K SPECTRUM into a word processor and filing system: Daisywheel printer/typewriter for sale, only £295 (no offers) includes 10 12 and 15 psi daisywheels, all interfaces and cables. Customised Tasword and Masterfile programmes available. Delivery possible. - Tel: Clacton (0255) 434329 days and evenings.

Acorns for sale

ACORN ELECTRON good condition £150 747 Flight Simulator £5. The Electron Book £3.00. Many blank cassettes £3.00. All together £155. Phone Mark after 4pm 624 6509 (London).

BBC SOFTWARE - Chuckie Egg, Darts, Howzat, Horror Castle, Shrinking Professor, - £6.00 each ono. Send no money yet. Write giving name address + phone, to Keith Hazell, Flat 20, 30 Grenada Road, Southsea, Portsmouth PO4 0RH.

BBC DOUBLEDENSITY disc interface kit by Lut. As new. £75.00. Tel: 0272 877789.

BBC GAMES SOFTWARE now unwanted will sell for half price the following. Starship Command, Monsters, Vortex, Overdrive, Engh, Snowball, Telephone 0245 50432 to inquire on price or reserve.

BBC 'B' with DFS & wordwise, £380 ono. Acorn Teletext adaptor, immaculate condition with TFS Rom & manual. £175 ono. New Wordwise version 1.20. (original). £30. Watford DFS Kit V-1.30. £85. Beebug Toolkit Rom £20. Phone 0227 750600.

ACORN ELECTRON £140 OKI Micro-line 80 printer £100 signalpoint printer interface £30. Cassette player software books etc. Tel: Oxford 770730.

BBC R H Light pen with software and manual worth £45. Will sell for £20 or swap for speech chip or quickshot joystick with programmable interface. Phone Bromsgrove for Adam 0527 73034.

BBC SOFTWARE for sale. Aviator £9, Planetoid £6, Rocket Road £6, Honeyfold Assembly £5, Meteors £5, Super Invaders £5, Painter £5, Planes £5, Starship Command £6. All originals. Telephone 0527 73034.

BBC MODEL B 1-2 OS 6 months old £275 ono. Write L. Edwards, 84 St. John's Road, Blechley, Milton Keynes, MK3 5EB.

BBC 'B' Excellent condition. Also Seikosha 250X printer. Both hardly used, + £150 software. Bargain £500 ono. Selling because buying car. Could deliver. Write, Tony Kempston, c/o John

Mowlem, Portal C. Ashley Lane, Wirsbush, Derbyshire.

BBC B 1-2 operating sys, + disc drive + disks + cass recorder, + s/w + mags + books, £499. Tel: Hoddesdon 468197.

BBC 'B' 1-2 O.S. V.G.C., boxed, leads, manuals + s/w. £325. BBC 'B' with disk interface as new, boxed manual + leads £400. Tel: 01 989 8449.

BBC 'B', 1-2 O.S., Acorn DFS, TEAC, 40 track disk drive, Wordwise, exman, + £60 s/w...£475 ono. Tel: 01 626 1567 (ex. 2292) Phil.

BBC B + Joystick + s/w. 5 mths old with spec 3 yr guarantee £340. Will consider Spec 48K in part exchange + cash. Tel: Camberley 33905.

BRAND NEW BBCB, speech synthesiser, sound amp, volume control, lightpen, s/w worth £100, book worth £25. Total value £650 sell £500. Selling due to emigration. Contact Mr. S. Patel, 14 Waverley Ave, Ashdown, Lincs OLE 8UY.

Dragons for sale

DRAGON 32, boxed, manual graphics, w.p. tape. £100 ono. Tandy TRS 80, 64K. Disk drive, s/w — £400. Tel: Crowborough (08296) 61252.

9 DRAGON GAMES tapes £1.50 each (all original), 2 books £2.50 each, 3 cartridges £5 each, printer lead £5, 2 joysticks £6, Sanyo SLIM3G recorder £10. Tel: Nigel (0532) 504431.

DRAGON 32 computer, tape recorder, large selection of software plus books and 12 Dragon Users and joysticks sell for £120 ono. Details discussed on phone. Tel. anytime. Grestford 5653.

DRAGON SOFTWARE 17 original tapes — includes The King, Space Shuttle, Cuthbert Jungle. 1 cartridge + 3 books total value £171. Sell for £85. David McNeish, 10 Graham Avenue, East Kilbride, Glasgow G74 4JZ Tel: East Kilbride (035 52) 20001.

DRAGON DOS with leads, new unused £50 ono includes manual. Or swap anything reasonable considered phone Peter Leach at Antrim 65345.

D32, immaculate cond. boxed with leads, Cass recorder £150, s/w, to cart joystick many drag user mags, worth £300 bargain £165. Tel: 01-886 4208 after 6pm.

DRAGON 32 for sale with cassette recorder and leads, boxed £50 ono. Phone Swindon 823867.

DRAGON 32, w. £500 s/w, + mags + j'sticks. (slightly faulty). £160-£180. Tel: 041 942 3752.

DRAGON 32, boxed, excellent condition, all leads included with cassette player £100 worth of software, Quicks-hot joystick, adaptor and 1 Dragon joystick worth £350. Sell for £170 ono. Tel: (0902) 751758 (evenings).

DRAGON, 3 joysticks, lightpen, m/code book, user magazines, software games & utilities, dust cover. £115. Tandy CGP-115 printer £95. together for £200. Tel. 01 36034 43.

DRAGON 32 micro for sale. Over £150 worth of software. 4 books, two new joysticks, worth over £360. Sell for £110. Phone Dorking (0306) 888426 evenings or weekends.

DRAGON 32, cassette recorder, colour TV, light pen, joystick, £200 + software inc. Chess, Bussard Bait, Kong, Scramble, Cartridge, Assembler, Disassembler, Graphics system. Books, cost £500 +. Sell £200 ono. Tel: (021) 354 9861.

Ataris for sale

ATARI V.C.S. console, joysticks, paddles and eleven games including Space Invaders, Superman and Yars Revenge. £90 ono. Phone 0847 65682.

BBC WITH BSF, Cimara Twin Drive 200K with power supply, lots s/w £575. Speech recognition system £40. Tel: 01-739 2273 or 01 249 9895.

ATARI 600XL, cassette recorder, game, joysticks, books, carrying case, 7 months old. £140. Tel: 01 399 2669.

ATARI VCS complete with nine cartridges inc. Space Invaders and Adventure. Boxed and in V.G.C. £100. 20 Gringley Road, Misterton, Doncaster. Tel: 0427 890479.

ATARI SOFTWARE 16 cartridges Defender Poleposition Gort Centipede etc. £8 each also 25 Cassettes Seadrone Bajabuggies Stratos Rearguard etc £4.00 each or the lot £150.00 or exchange for Atari 800 Conway 9 Barry-leys Luton Beds.

ATARI 410 cass rec brand new boxed £25.00. Tel: 359 1177.

ATARI 400, 48K, Recorder, Basic, Manuals, + paddles, joysticks, over £200 original tapes, inc. Pacman £100. Tel: Glasgow 618007 (after 5pm).

Commodores for sale

VIC 20 C2N 16K switchable ram. Intro to Basic 1 and 2. Joystick, Mags and Books, all boxed and over 120 games. £170 ono. Tel: Derek 950 0685 after 5 p.m.

CBM 64 tape to disk transfer service. Phone 01-940 7627 after 6 p.m. for details or write P.I. Services, 48 Sheen Park, Richmond, Surrey TW9 1UW. (Enslow s.a.e.) Thank You.

CBM 64 software for sale. All the best games including Valhalla, Loco, Beachhead, Encounter etc. All originals. Write to Graeme Mort, 34 Knock Way, Gallowmill, Paisley, Scotland.

CBM 64. C2N 2 sticks over. £200 with

games inc. Football, Solo Flight, Black Hawk, Beachhead, 4 months guarantee. As new. £250. Tel: 0246 203418, Davison.

VIC 20 cartridges: Gorf £8, Chess £6, Avengers £6, The Count, Mission Impossible, Jupiter Lander, Cosmic Cruncher, Alien, Menagerie. All £6 each or the lot £50 ono. Tel: 061 652 0905 after 8 p.m.

32K VIC 20 + C2N + Joystick + over £200 of original s/w + Intro to Basic, Books and Mags. £150. Tel: Andy 01-841 0675 after 5 p.m.

COMMODORE 64 owner wishes to contact other 64 owners to swap programs and ideas. Send your list of programs for exchange to: Janfrick Helgesen, Joh Hjorts vei 24, 5030 Landas, Norway.

COMMODORE 8K ram cartridge, VIC 1110. Perfect working order and condition. Also "Jetpac" game by ultimate. Original condition. Both for £20 or will split. (0244) 675717.

VIC 20 computer, C2N Recorder, 16K switchable ram, 8K standard ram, 3 cartridges, approx 40 games, book, £200 ono. Tel: (0248) 724 654.

COMMODORE C2N cassette unit. As new, with instruction booklet. Could sell by post if necessary. Accept £25 ono. Chester 675717.

CBM 64 computer, disk-drive, monitor, cassette, manuals, many books, magazines, games, utilities, joysticks, multiplan 64, vizawrite, mir-roassembler, superbase 64, accessories. All in excellent condition.

Upgrading. Complete system cost £1,200. Sell £750. Tony 01-690 3820.

VIC 20 plus C2N cassette plus 16K ram, 10 cassettes including jetpack, chess, arcadia. Vic revealed plus other books and manuals. All good condition and boxed. £160. Tel: Wincanton (0963) 33109.

CBM 64 software originals. Will sell cheap or swap. Decathlon (A), solo flight, valhalla, falcon, patrol, stockmarket, monopoly, wanda, fall of Rome. Tel: 061 439 9649 after 6 p.m.

SWAP. YOUR unwanted software for the Vic 20 and C64 — this is not a club. Send s.a.e. to D. Woodward, 45 Stone-wood Ave., Hall Green, Birmingham B28 9 AX. All swaps free.

VIC-20, RECORDER, + 3K, 13 rom cartridges, 6 books, 7 slot Atr expansion unit, joystick, over 129 games, many arcade + mags. Only £230 ono. Bolly, 35 Moor Top Drive, hemsworth, West Yorks.

ADMAN SPEECH synthesiser for CBM 64, will possibly fit Vic 20 also, only two months old. V.g.c. New equipment forcesale. £25, no offers. Phone South Ockendon 855757, buyer collects.

CBM 64. WILL swap Simons basic,

used twice, for easy script or similar word processor, Database or Spreadsheet considered. Tel: 061-436 1205.

VIC 20 MACHINE code monitor, super lander, pirate cove and innovative computing book, £20. Tel: 01-669 7108.

VIC 20, C2N, 16K switchable ram pack, intro to Basic 1 software including jetpack and crazy quon. Good bargain at £130 ono. Tel: (0532) 520855 Leeds.

CBM/PET 32K professional computer (perfect) with VDU, C2N recorder, manual and software. £250. Chips: Toolkit, £16. Superchip, £25. Arrow, £16. Also various PET books and software sold separately. Phone: 01-992 0031.

VIC 20 COMPUTER + cassette, + 8K ram, 22 games, tape + introduction to Basic 1. Quick sale. £100 ono. Tel: 593 5021, Dagenham. (Still under guarantee)

COMMODORE 64 software, rat-race, siren city £4, son of blagger £4, kong £2, ultisynth £7, revenge £4, cuddly cubert £4, china miner £4, stix £3. All originals. Phone 0656 5505, ask for Robert.

CBM 64 + C2N cassette, + MPS 801 printer, + box of paper, + joystick, + programmers. Reference manual + £150 worth of software (including Mr. Wimpy, space shuttle etc). Only £430 ono. Will deliver. Tel: (0325) 321907...NOW!

VIC-20 PRINTER + power supply and printer rolls £40. Super expander + books and programs £20. Pointmaster, joystick £5. Tel: 832305 or write 12 Derwent Avenue, W. Auckland, Bishop Auckland, Co. Durham DL14 9LM.

CBM 64 GAMES, Blackhawk, Slurry, £4.50 each. Tel: 051 521 2736. Ask for Paul.

VIC 20 C2N cassette, super expander, switchable 16K ram, mother board and joystick, adventure and sargon chess cartridges, 19 cassettes and 4 books. All boxed. £200.00.

C64 + C2N cassette + quickshot, joystick, + s/w, including Hunchback, Kong etc. Magazines unused. Still boxed. Sell £210 ono. Tel: Andrew (eves.) 01-592 7949.

C1520 PRINTER PLOTTER, 3 months old, sell £40. Tel: 01-592 2204.

VECTREX with five game cartridges, worth £200. Asking £99. Contact D. Carr, 17 Bristol Road, Sheffield S11 8RL. Please include telephone no. if possible.

CAMBRIDGE PROGRAMMABLE joystick plus interface and tape. Excellent condition £25. 061 620 2598.

LYNX 48K. Boxed as new, manual, leads, demo tape, plus assembler/disassembler, Lynx user magazines, £110 ono. Clive Newton, 90 Pentre Close, Cymbran, Gwent NP44 7LR. Tel: Cymbran (06333) 60547.

LYNX 48K boxed as new. £110 ono.

COMPUTER SWAP

COMPUTER SWAP

Please write your copy in capital letters on the lines below.

Name.....

Address.....

Telephone.....

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.
Warning: It is illegal to advertise pirated software.

Phone Malcolm (01) 377 0020 ext. 229 days or (01) 553 0349 after 7 p.m.
CGL SORD M5 with Basic 9 cartridges and manuals. Graphic Designer Cass., 3 Games Cartridges, 2 Games Cassettes, 1 Joypad £175. Tel: 0772 30124.
VIDEO GENIE, 16K cassette, sound. Many books/software, £75. Also ZX printer £10. Also Alphacom 32 printer for Spectrum, £45. Tel: Kirkham 682337.

SINCLAIR INTERFACE 2, hardly used, boxed, £15 ono. Also ZX printer as new, boxed, with extra paper and ZX81 p.s.u., £30. Tel: Mike Aldridge (0922) 52239 any time.

FOR SALE near complete collection of PCN, asking £6. H.C.R. Epron programmer, £35 ono. BBC software, Legion, Checkout, Ghoulis, Vortex, asking £3.50 each. Phone 736 7714. Ask for Salvinder.

SINCLAIR QL, brand new, unwanted prize £360. Phone 0439 70706, evenings.

MICRO DRIVE + interface 1, brand new + one cart, £75.00 ono. Tel: 01-691 2247 between 5 p.m.-10 p.m.
TEXAS TI99/4A, as new, plus joysticks, connect four cartridge and "basic" education tape, £75 ono. Clive Newton, 90 Pentre Close, Cwmbran, Gwent NP44 7LR. Tel: Cwynbran (06333) 60547.

CBM 64, cassette, [stick, disk drive, 1701 colour monitor, all under £100, £100 s/w inc. Solar Flight, Word Processing, Hobbit, etc. £550 or will separate. Tel: 0634 812457.

VIC 20 plus cassettes for sale £80 phone Peter 802 3946.

COMMODORE VIC 20 w. C2N cassette unit, dust covers, 3K + 16K expan. carts, Sargon 2 Chess cart. Intro to Basic P.I. Books on Vic 20, Educational packs, also, Games, etc. Jelpac. £165. Tel: Paddock Wood. 3846.

CBM 4032 monitor and keyboard 4040 dual disc drive 4022 printer plus programs paper and manuals professional outfit virtually unused. Cost over £2,000 accept £1,000. 0405 813794.

CBM 64 new s/w for sale. Beach Head £7, Arabian Nights, Daley's Decathlon £5. Also TKV and the Boss. Tel: Andy on 0224 582164 after 6pm.

VIC 20 plus cassette recorder + 16K switchable ram pack and joystick with £170 worth of software. Total TS £388. Am asking £160. Phone after 6. Muzler. 01 385 2699.

CBM 64 software at half price. Aztec challenge, manic miner, Pipeline, Solo Flight, Killer Watt and many others. Tel: 01 318 4880 after 6pm (London).

COMMODORE 64 C2N cassette, joystick many books and over £300 worth top software still under warranty and boxed £369 or swap for Amstrad 64 with colour monitor. Phone 0630 57129.

COMMODORE 64 original software for sale half price. Heroes of Karn, Hulk, Lords of Time, etc, etc. 40 Brook Road, Rotherham, South Yorks, S65 2UW. Phone Rotherham 70149.

CBM 64 games cartridges. Le Mans, Jupiter Lander, Visible Solar System cost £30 accept £13.50 incl. postage. Tel: 0795 75420 all in perfect condition.

UNUSED COMMODORE books for sale at half prices. Contact T. V. Tran, 130 Elgar Ave, Great Malvern, Worcs, WR14 2HA.

COMMODORE CBM/PET high resolution graphics board. Converts "new Rom" 2001 and 3000 series machines to display Hi-res graphics. Includes extra 8K screen memory. Full instructions £59 ono. Tel: Chester 675717.

VIC 20 STARTER pack, 9 cart, 8 cass., 2 educ cass. Sell £220 ono. Tel: 572-3999.

ADVENTURE HELPLINE

Colossal Adventure on BBCB.

How to get the lamp into the Plover Room? Also, how to open the clam and get its pearl? Also, how to open the clam and get its pearl? Tim Moll, 119 Millhouses Lane, Sheffield S7 2HD.

Greedy Gulch on Spectrum.

How to find ammunition for the gun? How to get past the rattlesnake? Mrs V Lawless, 16 Culross Avenue, Manchester M10 0SR.

Hitch-Hikers Guide on Spectrum.

How do you get past the Tiger in the museum? Also, what do I do when I have been ejected out of the Vogan spaceship? S Allen, 42 Landowne Cres, Stanwix, Carlisle, Cumbria CA3 9EW.

Pirate Cove on Vic 20.

How do I get past the crocodiles in the pit which is in the cave? Gary Baker, Kirkland Cottage, Stranraer, Scotland.

Hobbit on Spectrum.

I cannot get out of the Elven Kings wine cellar, nor out of the Goblins Dungeon. Stephen Sedlen, 97 Maisemore, Yate, nr Bristol BS4 14UW.

Adventureland on Vic 20.

How to get past the Lava Stream? How to

get the honey? Paul Williams, 1 Lindir Street, Hellan, Denbigh, Cwtyd.

Espionage Island on Spectrum.

How do I get past the swamp which is sinking? I keep sinking up to my neck. Chris Kissack, 30 High View

Hobbit on Spectrum.

How do I escape from the Goblin's Dungeon and the King's Wine Cellar. Alan Sayles, 6 Measowbank Street, Dumbarton, Strathclyde.

Voodoo castle on BBC.

What enables me to become small enough to enter the crack at the bottom of the chute? John May, 44 Ruskin Road, Chadwell-St-Mary, Grays, Essex.

Ultimate Adventure on Dragon.

One is supposed to buy articles from a market to help with the adventure. Every time I try the computer replies 'Can only be bought in the market' when I am already in the market. Mrs P Griffiths, 28 Trent Road, Billings, Near Wigan, Gtr Manchester.

Goblin Towers on Commodore 64.

I am lost in the forest. I cannot seem to progress in any direction. I am new to adventures. Janet Foster, 24 Moresby Avenue, Normoss, Blackpool.

Pirate's Cove on Vic20.

On pirate island, in the cave maze, how do I feed and get past the crocodiles?

Bryan Gault, 5 Sherwood Drive, Brant Road, Lincoln.

Smuggler's Cove on Spectrum.

I can't get into the trapdoor and when I go past it I come to a barrier which I cannot get past. Jim Fraser, St Martha's, 6 Ramsey, Isle of Man.

Voodoo Castle on Vic20.

How do you open the Ju-Ju bag? How do you get out of the jail cell and who is (in the adventure) your friend? Julian Foley, The Anchorage, Back of the Hill, Annan, Dumfriesshire.

Urban Upstart on Spectrum.

I am unable to get past the fan or the airport officer sergeant, even after offering them all. Christopher Rainer, 2 Mill Hill Road, Hinkley, Leicestershire.

Snowball on Commodore 64.

How do I get through the security door? What is the combination? Howard Seymour, Welwyn Garden, Herts.

Hobbit on 64.

How do I get out of the Goblin's Dungeon? How do I kill the dragon? Gregory Neilson, 86 Herbert Avenue, Parkstone, Poole, Dorset.

**SEE
INTERNATIONAL
ADVENTURE CLUB
(CLASSIFIED)**

Diary

Event	Dates	Venue	Admission	Organisers
ZX Fair	Oct 6 10.00am-5.00pm	Pudsey Civic Centre Pudsey W Yorks	75p adults 50p children	Northern Premier Exhibitions 0832 553854
Livingston Computer Fayre	Oct 6-7 10.00am-5.00pm	Peel House Ladywell Livingston W Lothian	£1.00 programme	hec/W Lothian Computer club
Computer Graphics 84 (over 18s only)	Oct 9, 10 10.00am-6.00pm Oct 11 10.00am-4.00pm	Wembley Conference Centre	Free in advance £5.00 on door	Outline Conferences 01-368 4466
Apricot and Sirius Show North	Oct 16-18 10.00am-6.00pm	New Century Hall New Century House Corporation Street Manchester	Free in advance from organisers	16 Bit Computing Magazine 01-2412354
Computer Games and Systems Retailer Show (trade only)	Oct 17-18 9.00am-5.30pm	Novotel London W6	Free	Macro Exhibitions 0992 468956
Home Computer Education and Games Fair	Oct 20 12.00pm-8.00pm Oct 21 10.00am-6.00pm	Luton College of Higher Education	£1.50 adults £1.00 children	Shaw and Kilburn 0582 29611
Electron and BBC Micro User Show	Oct 25-27 10.00am-5.00pm Oct 28 10.00am-4.00pm	Alexandra Palace London N22	£3.00 adults £2.00 children	Database Publications 061-456 6363
Home Tech 84	Oct 26-29 10.00am-6.00pm	Bristol Exhibition Centre	£1.50 adults £1.00 children	Nationwide Exhibitions 0272 650465
Computers in Action	Oct 30 10.00 am-6.00pm Oct 31 10.00am-8.00pm Nov 1 10.00am-6.00pm	Anderson Centre Glasgow	Free	Trade Exhibitions 041-204 0280
Mycomp (Thames Valley Personal Computer Exhibition)	Nov 1-3 10.00am-6.00pm Nov 4 11.00am-8.00pm	Fulcrum Centre Slough	£2.00 adults £1.00 children	Swan House Special Events 09322 43866

Spectrum

- 1 (7) Match Point (Psion)
- 2 (2) Full Throttle (Micromega)
- 3 (3) Tornado Low Level (Vortex)
- 4 (9) Cavalon (Ocean)
- 5 (8) Salvo Wolf (Ultimate)
- 6 (-) Jack and the Beanstalk (Thor)
- 7 (1) Daley Thompson's Decathlon (Ocean)
- 8 (6) Rasapaloo (Bug Byte)
- 9 (-) American Football (Digital Integration)
- 10 (5) Fighter Pilot (Digital Integration)

(Figures compiled by W H Smith and Son, London)

Vic 30

- 1 (3) Snocker (Visions)
- 2 (5) Sub Hunt (Mastertronic)
- 3 (3) Flight 015 (Craig Communications)
- 4 (-) Max (Anirog)
- 5 (9) Duck Shoot (Mastertronic)
- 6 (6) Tower of Evil (Thorn EMI)
- 7 (8) Crazy Kong (Interceptor)
- 8 (-) Vegas Jackpot (Mastertronic)
- 9 (10) 3D Maze (Mastertronic)
- 10 (7) Phantom Attack (Mastertronic)

(Figures compiled by Boots/Websters)

Atari

- 1 (-) Solo Flight (Centre Soft)
- 2 (-) Caverns of Khafka (Centre Soft)
- 3 (7) Zaxxon (Centre Soft)
- 4 (-) Orc Attack (Atari)
- 5 (-) Carnival Massacre (Atari)
- 6 (-) Leggit (Imagine)
- 7 (-) Slinky (Centre Soft)
- 8 (-) Captain Sticky's Gold (English Software)
- 9 (-) Computer War (Atari)
- 10 (9) Colony 7 (System 3)

(Figures compiled by Boots/Websters)

Commodore 64

- 1 (1) Scramble (Leisure Genius)
- 2 (5) Beachhead (US Gold)
- 3 (6) Decathlon (Ocean)
- 4 (4) Arabian Nights (Interceptor)
- 5 (-) Football Manager (Addictive)
- 6 (7) Decathlon (Addictive)
- 7 (8) Olliver's Gold (Ocean)
- 8 (-) Stunt Bike (Ocean)
- 9 (-) Space Walk (Mastertronic)
- 10 (6) Meteoroids (DE Tronics)

(Figures compiled by Boots/Websters)

ZZX1

- 1 (1) Alien Raid (CRL)
- 2 (2) Walk the Plank (Novus)
- 3 (-) Black Crystal (Mastertronic)
- 4 (9) Flight Simulation (Psion)
- 5 (3) X-ray Kong (PSS)
- 6 (5) Planet Raider (Novus)
- 7 (7) Espionage Island (Psion)
- 8 (8) Krypton Ordeal (Novus)
- 9 (4) Meteor Storm (DE Tronics)
- 10 (6) Meteoroids (DE Tronics)

(Figures compiled by Boots/Websters)

Dragon

- 1 (1) Up Periscope! (Beyond)
- 2 (2) Ring of Darkness (Wintersoft)
- 3 (3) Cuthbert in the Mines (Microdeal)
- 4 (5) Eightball (Microdeal)
- 5 (8) Dungeon Raid (Microdeal)
- 6 (6) Mr Dig (Microdeal)
- 7 (9) Buzzard Hunt (Microdeal)
- 8 (-) The King (Microdeal)
- 9 (10) Hungry Horse (Melbourne House)
- 10 (-) Cuthbert in Space (Microdeal)

(Figures compiled by Boots/Websters)

BBC B

- 1 (-) Elite (Acornsoft)
- 2 (1) Fortress (Pace)
- 3 (-) Overdrive (Superior)
- 4 (5) Micro Olympics (Database)
- 5 (9) Wallaby (Superior)
- 6 (2) Ghoulia (Micro Power)
- 7 (8) Aviator (Acornsoft)
- 8 (3) Smash and Grab (Superior)
- 9 (10) Stock Car (Micro Power)
- 10 (4) Spitfire Command (Superior)

(Figures compiled by W H Smith and Son, London)

Books

- 1 (3) A Guide to Playing the Hobbit (Melbourne House)
- 2 (7) Battle Games (Usbourne)
- 3 (9) Space Games (Usbourne)
- 4 (-) Commodore 64 Games Book (Melbourne House)
- 5 (8) Practical Spectrum Machine Code (Shiva)
- 6 (4) Machine Code Sprites and Graphics (Sunshine)
- 7 (10) Computer Programming for Beginners (Fontana)
- 8 (8) 100 Programs for the BBC Micro (Prentice-Hall)
- 9 (-) Spectrum Book of Games (Granada)
- 10 (-) Adventures in BBC Basic (John Wiley)

(Figures compiled by Boots/Websters)

NETWORKING

As the festive season draws nearer, the books get bigger — the particular offering in front of me being *The Complete Spectrum*.

To its credit, the book does (for once) live up to the title. There is everything here, from wiring up the plug and extensive instructions on which end of the TV cable to put into the telly, to the elements of machine-code programming and microchip architecture.

Not bad for 487 pages. There are also useful sections on add-ons, networking, adventure programming and more.

However, beware. Much of the material has been previously published in other guises by Ian Sinclair *et al*, so be careful to read the list of books on the inside cover.

All in all, though, if you are buying a Spectrum and want to know the ropes, there are definitely worse ways of spending ten quid.

Book	<i>The Complete Spectrum</i>
Price	£9.95
Micro Supplier	Spectrum Granada Publishing Grafton St London W1

ANNOTATED

A book useful for experienced Basic programmers ready to move on is *Advanced Basic and Machine Code for the Commodore 64* by the ubiquitous Peter Gerrard.

The book begins with advanced Basic programming techniques such as file searches and data storage before moving into machine code with a simple sprite moving program discussing Basic instructions, flags and such like.

There are a number of useful machine code routines that can be incorporated within your own programs which are well annotated to show exactly what's going on.

A book better than many of the type; a useful and clear set of appendices on machine code instructions are included as well.

Book	<i>Advanced Basic and Machine Code for the Commodore 64</i>
Price	£6.95
Micro Supplier	Commodore 64 Duckworth The Old Piano Factory 43 Gloucester Crescent London NW1

This Week

Program	Type	Micro	Price	Supplier
Frogman	Arc	Ace	£4.95	Mountsoft
Moneybags	Arc	Ace	£4.95	Mountsoft
Dragon	Ed	Amstrad	£4.00	Terry Soft
Potluck	Ed	Amstrad	£4.00	Terry Soft
Pontoon	S	Amstrad	£4.00	Terry Soft
Amstrad Assembler	Ut	Amstrad	£9.95	Mountsoft
Matchmaker	Ut	Amstrad	£4.00	Terry Soft
Runemagic — The Wizards	Ad	BBC	£6.95	Triffid
Runemagic — The Secret River	Ad	BBC	£6.95	Triffid
Microgo 1	S	BBC	£9.95	Edge
Text Ed	Ut	BBC	2.25	Js
Pettigrew Chronicles	Ad	Commodore 64	£9.95	Shards
The Armour	Ad	Commodore 64	2.99	EFC
Ad Infinitum	Arc	Commodore 64	£7.50	Mr Chip
Kikstart	Arc	Commodore 64	7.50	Mr Chip
Games Creator	Ut	Commodore 64	12.95	Mirrorsoft
Supabasic	Ut	Commodore 64	9.99	Interceptor
Ace High	Arc	Dragon	6.95	Tudor Williams
Kentilla	Ad	Spectrum	6.95	Micromega
Pettigrew Chronicles	Ad	Spectrum	9.95	Shards
Se-Kaa of Assiah	Ad	Spectrum	7.50	Mastertronic
Wrath of Magma	Ad	Spectrum	12.50	Mastertronic
All or Nothing	Arc	Spectrum	5.95	Abbe
B.M.X. Trials	Arc	Spectrum	6.95	Llainlan
Braxx Bluff	Arc	Spectrum	6.95	Micromega
Crossman	Arc	Spectrum	2.95	Js
Grave Doom	Arc	Spectrum	6.95	Llainlan

Pottergeist	Arc	Spectrum	£5.95	PSS
Runaway Train	Arc	Spectrum	6.95	Llainlan
Spider Attack	Arc	Spectrum	6.95	Llainlan
Super Mutt	Arc	Spectrum	5.95	Silver Soft
Battlecars	S	Spectrum	7.95	Games Workshop
D Day	S	Spectrum	7.95	Games Workshop
Financial Manager	Ut	Spectrum	£3.45	Js
Music Master	Ut	Spectrum	£17.95	Supersoft

Key: Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

A MORAL?

The Key to Time is an adventure from a new Spectrum software house which calls itself Lumpsoft!

It seems from a quick play to be a well planned adventure with a wide vocabulary, some wit, and some original ideas.

There are, however, two big problems with it. Firstly it appears to have been written with *The Quill* but it is not credited. Bad.

Secondly, the entire adventure is constructed around characters, ideas, and plots from *Dr Who*. This is also bad.

The mere fact that Lumpsoft are (presumably) a small software house and have in other respects tried hard with the adventure does not excuse the fact that many of the ideas are not their own.

I guess the BBC will fight their own battles though, and in other respects this is a fun



program with much to recommend it.

Will you let the morality of property rights sway you?

Program *The Key to Time*
Price £5.95
Micro Spectrum
Supplier Lumpsoft
17 Hardrow Road
Leeds LS12 4BX

PROFESSIONAL

Kensington was, and for all I know, is, one of the most successful board games of recent times.

Without repeating the rules

in their entirety, the game involves the strategic placing of stones on a board that looks rather like an Islamic mosaic.

Leisure Genius is continuing in its production of computer versions of famous board games with a version of *Kensington* for the Commodore 64.

Although simple in concept the game can demand careful strategic thought and consequently represents quite a challenge in programming — the version appears to play well, with, thankfully, faster response times than Leisure Genius' version of *Scrabble* for the 64.

The screen displays the classic board and lets you choose from a variety of options including watching the computer play itself, to your simply playing against a friend using the TV screen as a board.

If you like *Kensington* then it's certainly fun to play against the computer and this is a very professionally-produced program.

I still don't think a TV screen is quite as aesthetically satisfying as a board, though.

Program *Kensington*
Price £12.95
Micro Commodore 64
Supplier Leisure Genius
3 Montagu Row
London W1H 1DB.

DECISIONS

Of Triptych software much has been heard but little seen until now.

Most of the Triptych releases have something interesting about them but *Decision Maker* got my vote as being the most unusual.

Easier to use than explain, it employs modern techniques of decision analysis to help you come to a conclusion about anything you are trying to decide upon — from whether to buy a compact disc player to whether to ask the person in the corner drinking brandy alexanders to come and boogie on the dance floor.

Obviously, it's intended for rather more serious purposes where the possible advantages are more clearly known.

Analysing the factors involved in the decision provides to be a fairly complex affair, and, as with all Triptych tapes, a

Pick of the week

DESERTED CITY

It's nearly a year since *3D Ant Attack* was first issued to an unsuspecting public who were to be stunned at its amazing Escher-like qualities and 3D multi viewpoint graphics.

At last comes *Zombie Zombie* — more of the same but with some interesting new features. For one thing, the bad-dies are not those nightmarish ants but yukky squelchy zombies that turn red to attack you at unsuspected moments.

Apart from the city, as enigmatically deserted and mysterious as ever Antesch was, you have a helicopter to take you over long distances safely, a blaster to deter zombies and a choice of gender. (By the way if you are a male who wouldn't ordinarily consider being the girl, for reasons of macho posturing disguised as sexual insecurity, take my advice — if you play the game as a girl you get better graphic effects.)

You also get the chance to design your own city and save it to tape — a lot of fun to try out on your friends. But what, you ask, is the objective of the



game? Well, this took me quite a while to figure out, as there isn't anyone to rescue and the instructions aren't telling. However I'm prepared to give you a hint — the music played is *Ten Green Bottles* and the zombies are green as well... well then... brilliant Holmes.

Program *Zombie Zombie*
Price £8.95
Micro Spectrum
Supplier Quicksilver
PO Box 6
Wimborne
Dorset
BH12 7PY

teaching tape is provided that shows you how to get the most from the program and use it properly.

In fact the teaching tape and the manual give you a pretty fair education in the analysis of risks and probabilities that is valuable in itself, quite apart from the program tape that actually lets you use this information in a practical way.

The program is well written with no obvious blunders in error trapping so even novice computer users should find it easy to use. In many ways it has succeeded in an area that few other programs have even attempted — using the computer to educate adults.

Program *Decision Maker*
Price £15
Micro Spectrum
Supplier Triptych
Sterling House
Station Road
Cerrards Cross
Bucks SL9 8EL

MASTER KEY

Psytrax is more than just a multi-screen game — it's beyond even a mega-screen game with 1000 screens, which should ensure it takes ages and ages to see everything there is.

The game involves moving a 'microdroid' around inside a computer looking for a number of master key cards that gradually open up the routes to the CPU.

The game is all done with slick sprite graphics and looks good — whilst it's basically a reaction game there are strategic elements as some objects have specific uses which have to be discovered by experiment.

The 1000 screens may be a little misleading though — all the screens have a similar layout and look. If you like

zapping things you won't go wrong here.

Program *Psytraxx*
Price £8.95
Micro Spectrum
Supplier The Edge
31 Maiden Lane
Covent Garden
London WC2

DODGY NEWS

Despite being written in Basic, *Velnor's Lair* won quite a few friends for its deviousness and imagination. Now the author of that program has produced a new adventure which loosely continues the plot of *Velnor*. The program is *Kentilla*, and aside from being in machine code it adds to *Velnor* in the form of graphics and interaction with other characters.

Before the program the plot — well, a bit of it. Grako wants to turn Caraland into a torture playground, despite the wishes of the locals who felt this would be a pretty naff idea. To the rescue comes whizzo wizard Ashka who sends Grako on his bike to the abyss (just take the A437 from Rhyl).

Anyway, *Velnor*, who was a bit miffed at his defeat at the end of *Velnor's Lair* finds Grako's tomes (spells, etc) which give him power beyond even *Dynasty's* Blake Carrington. It all turns out to be Grako's plan, *Velnor* does himself a mischief when he tries to use the spells and is duffed up by Tylon, and Grako manages to escape, complete with the Moonstone of Algrath, which makes him even worse than before. The citizens of Caraland reckon

this is a bit of very dodgy news.

The adventure understands fairly sophisticated sentences and the graphics, though small, are neatly drawn and appear instantaneously. The ingeniousness which characterised *Velnor* is here too.

The use of different colours for the different sections of text is also a good idea. Plenty of atmosphere and a lot of fun.

Program *Kentilla*
Price £8.95
Micro Spectrum
Supplier Micromega
230-236 Lavender Hill
London SW11 1LE

MEDIUM LEVEL

The Legacy is a text adventure for the Spectrum which has the prime virtue of not featuring a single elf, troll, fire-breathing dragon or mystic crystal sphere.

The Legacy has, instead, halls, dining rooms, taxis, and library. Also a mysterious activity involving hats. Not only these, but it comes complete with a pub in which you can drink (at a cost of some points).

The Legacy is intended to be an adventure of the medium level — it'll need a little thought and perhaps a bit of previous experience with adventures but shouldn't involve several months thought over each question.

Program *The Legacy*
Price £5.95
Micro Spectrum
Supplier Tamsot
1 Golden Square
Hathern
Loughborough
Leics LE12 5HU

CODE WORD

The *Ket* trilogy is now complete with the release of *The Final Mission*. This final section looks the most difficult of all, and it will certainly have helped to have played the other two parts, as for one thing, you can load in your character as developed through the other sections if you have completed them.

For those not familiar with the *Ket* adventures, they are characterised by being very vast and very difficult indeed



although usually only using simple Verb-Noun instructions.

In *The Final Mission* you finally get to confront the evil Vran Verusbel if you can make your way through the five Gate Guardians alive. If you get to the end with this one, the special code word combined with the special code words of the previous two parts gives you a complete sentence and you get to win a video recorder.

Program *The Final Mission*
Price £5.50
Micro Spectrum
Supplier Incentive Software
54 London Street
Reading
RG1 4SQ

IN DARKNESS

Out of the Shadows is an unusual adventure. It has the interesting idea that you have to explore a land — illustrated by an on-screen map in which large sections are obscured by darkness. You have a torch which will light a certain area, but not where corners or buildings obscure the beam.

You must explore this world fighting various baddies and meeting people who may be of use to you, building up levels of character skill and searching various treasures.

Commands are mostly verb-noun but that doesn't limit the variety within the game. With the elements of magic, fighting stamina, knowing what to buy, when to fight and when to run away it should appeal to more traditional strategy adventurers. Cheap too.

Program *Out of the Shadows*
Price £5.95
Micro Spectrum
Supplier Mizar Computing
104 Bradwell Road
Bradville
Milton Keynes
MK13 7DH

BUG BULLETS

Just before the poor old Vic 20 finally dies its long overdue death at the hands of the C16, it's worth noting that there are still odd pieces of software being produced. Not only that but some pretty good software too. Palace Software, best known for its *Evil Dead* epic, have produced two games, *Squish* and *Bricks*.

Squish is pretty well summed up by its name, no subtlety here. The simple idea is to squish as many bugs as possible by hitting them in the right way, avoid touching them at all at other times and beware the bug bullets.

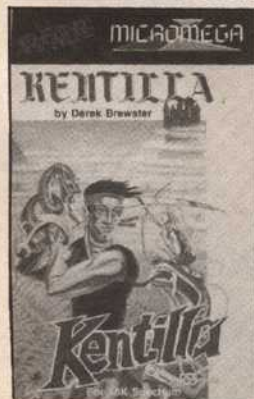


There are 20 levels in all, in some of which the bugs are invisible, not bad for less than 5K.

Program *Squish*
Price £5.99
Micro Vic20
Supplier Palace Software
275 Pentonville Road
London N1 9NL

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.





50 forward

What is the most natural way in which to express ideas in programming, and which is the most sensible?

Is it more natural to say $2+3$, as in Basic or Pascal, is it more natural to say (SUM 23), as in LISP, or is it more natural to say $23+$, as in Forth?

I will argue that Basic and Pascal are rather more unnatural than Forth in the way they perform operations.

The first style of adding two numbers given above is called *infix* notation, because the arithmetical operator (the plus in this case) is fixed in between the numbers, and this is the style we learn at school. This, in turn, is the reason why it seems the only way.

The second style of presentation is called *prefix* notation, because the operator precedes the numbers on which it operates.

The second style of presentation is called *postfix* notation, because the operator precedes the numbers on which it operates.

The final style is known as *postfix*, because the nature of the operator is postponed until we know the value of the numbers.

What happens when the infix indoctrination is not present?

In a study of the teaching of children in schools, using turtle graphics, it was discovered that when the children were deciding about the movement of the turtle they often said aloud "50 forward".

In the programming language the children were using, they had to change this instruction to *Forward 50*. The children had to change from a postfix instruction in English to a prefix notation in the programming language, where the postfix notation was far more natural.

Put yourself in the place of somebody drawing a square in turtle graphics, where first we decide

how far to move (say, :Distance), and then we turn through 90 degrees (either right or left). The sequence so far is

:Distance units 90 Deg-rt.

This line of program (in a mythical language) uses postfix notation, and is in perfect harmony with the way we think. We move so many units forward and turn so many degrees to the right.

To draw a square this sequence has to be performed four times:

:Distance units 90 Deg-rt 4 times.

The instructions from the beginning of the sequence, up to the number 4, are repeated that number of times. If there are other instructions before the repeated sequence, then we can use square brackets to delineate the limits of the repeated action. For example,

35 Deg-rt [:Distance units 90 Deg-rt] 4 times
that is, turn through 35 degrees left, and then draw the square.

Suppose there is a special instruction to draw a square, where the instruction is already provided by the system, or we have written a procedure to do so. To draw a square of side 100 we simply enter

100 Square

and nothing could be easier.

Now take the example "You have five sweets, then somebody gives you one more. How many will you have?" Obviously we can code this in the mythical language as

or, equivalently, 5 1 More is
5 1 * Print.

It is clear that postfix notation is the logical notation to use because it matches thought processes, and allows these thought processes to be discussed; and it leads to greater efficiency on the computer, because it is more logical.

Consider these three examples where a square is to be drawn with a side of $(2+3) \times (4-5)$:

Infix	Inf.Square (2+3)*(4-5)
Prefix	Pref.Square Mult Add 2 3 Sub 4 5
Postfix	2 3 More 4 5 Less Multiply Post.Square

I prefer the first and third versions. The first version is useful because that is the way conventional arithmetics work (but for no other reason), and the third version presents operators in the order in which we perform the tasks.

The prefix form contravenes the task ordering, because the last operation to be performed is *Post.Square*, yet it is the first instruction to be encountered.

In fact, when you look at the infix form—the form we are all taught in schools—that is pretty confused as well. With infix you have to remember the order of precedence of the operators.

Boris Allan

Hercules' problem

Puzzle No 127

Here is one of the lesser known of the Labours of Hercules. One thousand silver coins were laid out in a row, one pace apart. Starting at a marker just one pace away from the first coin, Hercules was to run to each coin in turn, then bring it back to the marker before going back for the next coin. And so on until the final coin had been collected.

Now, each coin bore a number from one to a thousand in accordance with its position in the row. The significance of this Hercules learned at the start of the race.

You see, in ancient mythology the numbers 7 and 13 were considered unlucky, and so any coin that bore a multiple of 7 or 13 was to be left and not collected. That is, he would pass on to the next coin. Similarly, any number that contained in it any of these digits — a seven, one or three — was also to be left.

How far did he run, in paces?

Solution to Puzzle no 122

As the zero is unaffected, it is clearly not present in either of the first two calculations shown, but the fact that there are nine different symbols displayed indicates that each of the other digits (one to nine) are used. As both products are the same, we have to find an instance where the products of two different single and two-digit numbers can result in a three-digit product — all digits being different.

10 FOR A = 2 TO 8 20 FOR B = 11 TO 99 30 LET C = A * B 40 IF C < 100 THEN GOTO 170 50 FOR D = A + 1 TO 9 60 LET E = C/D 70 IF E <> INT(E) THEN GOTO 180 80 LET Z = A*100000000 + B*1000000 + C*1000 + D*100 + E 90 ZS = STR\$(Z) 100 FOR N = 2 TO 9 110 FOR M = N+1 TO 10 120 IF MID\$(ZS, N, 1) = MID\$(ZS, M, 1) THEN GOTO 180 130 NEXT M 140 NEXT N 150 PRINT A; B; C; D; E 160 NEXT D 170 NEXT B 180 NEXT A

This shows two possible answers: $2 \times 78 = 56$ and $4 \times 39 = 156$ or $3 \times 58 = 174$ and $6 \times 29 = 174$. Comparison with the third equation shows that it is the second of these two that provides the answer.

Winner of Puzzle 122

The winner is: Hugh Walker, Burnet Avenue, Burham, Guildford, Surrey, who receives £10.

Rules

If the puzzle prize can be sensibly solved using a computer, then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 127 is October 19.

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HE GOES, HE GIVES ME A SCRIPT
FOR THIS WEEK'S PCW BACK
PAGE, THINKING THAT MY
RELIGIOUS ADHERENCE TO HIS
INSTRUCTIONS FOR SAME OVER THE
LAST 4 WEEKS IS A TREND I AM
PREPARED TO CONTINUE. WELL,
HERE IS MEL'S BACK PAGE.



OKAY? NOW...
HERE'S MINE...

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HI-HO! ANYONE IN?
KOFF KOFF -
COME IN, CLAIR!

PIMAN! IS IT YOU? IT IS!
WHY THE JOKE BEARD
AND HAIRPIECE... AND THE
PILLOWCASE TIED AROUND
YOU... AND... HACK, HACK...
THOSE CIGARS??



OLD CHRISTIAN'S
OUT, SO I'M SITTING
IN FOR HIM...



YOU KNOW - TALKING
TURKEY WITH THE CLIENTS
(HAHA, DEREK, HOW'S THE MISSUS?
OH-AH - THE POSTMAN, EH? TOO BAD - I'LL
GET BACK TO YOU!) NO, THIS IS EASY!

DID HE ASK YOU
TO SIT IN?



NO... KOFF... HE DOESN'T KNOW...
BUT HE'S ALWAYS DRESSING UP AS ME,
SO I'M... NGOPH! NGOPH! GETTING
MY OWN
BACK!

OH, DO PUT OUT THOSE CIGARS
- YOU'LL POLISH YOURSELF OFF!



GRETCH! I KNOW. ANYWAY, I'LL
HAVE TO STOP BEING HIM
NOW. HE WENT ON A
SPONSORED RAMPADE WHEN
ONLY 2 WHOLESALEERS PUT
THEIR MONEY WHERE
THEIR MOUTH IS, RE
"DEUS". AND HE'S
DUE BACK SOON...

OH, I'LL
CATCH ON
WHEN THEY
STOP FEEL-
ING FROM
THE SHOCK
OF IT ALL!



WHAT NOW, MORE
MAKE-UP?!

YEH... I'VE GOT TO
SEE TO MY BUSINESS
IN THE TOWN...



WHAT BUSINESS IN THE
TOWN, O ZOOT-SUITED ONE?

FOLLOW ME
AN I'LL SHOW
YOU.



WHY ISN'T MORRIS
TAKING US?

WOULDN'T
WOULD IT?



UNLESS YER
INTERESTED IN
PURCHASIN', LADY

A SHIP!

OUCH

WILL THIS LEAD ANYWHERE?
WILL CLAIR GET A REFUND FOR
HER HAIRPIECE? WILL I LOSE
MY JOB? TUNE IN AGAIN!

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